



# Alyza IQ PO4

1- AND 2-CHANNEL MEASURING SYSTEMS FOR ONLINE DETERMINATION  
OF ORTHO-PHOSPHATE IN AQUEOUS SAMPLES



a xylem brand



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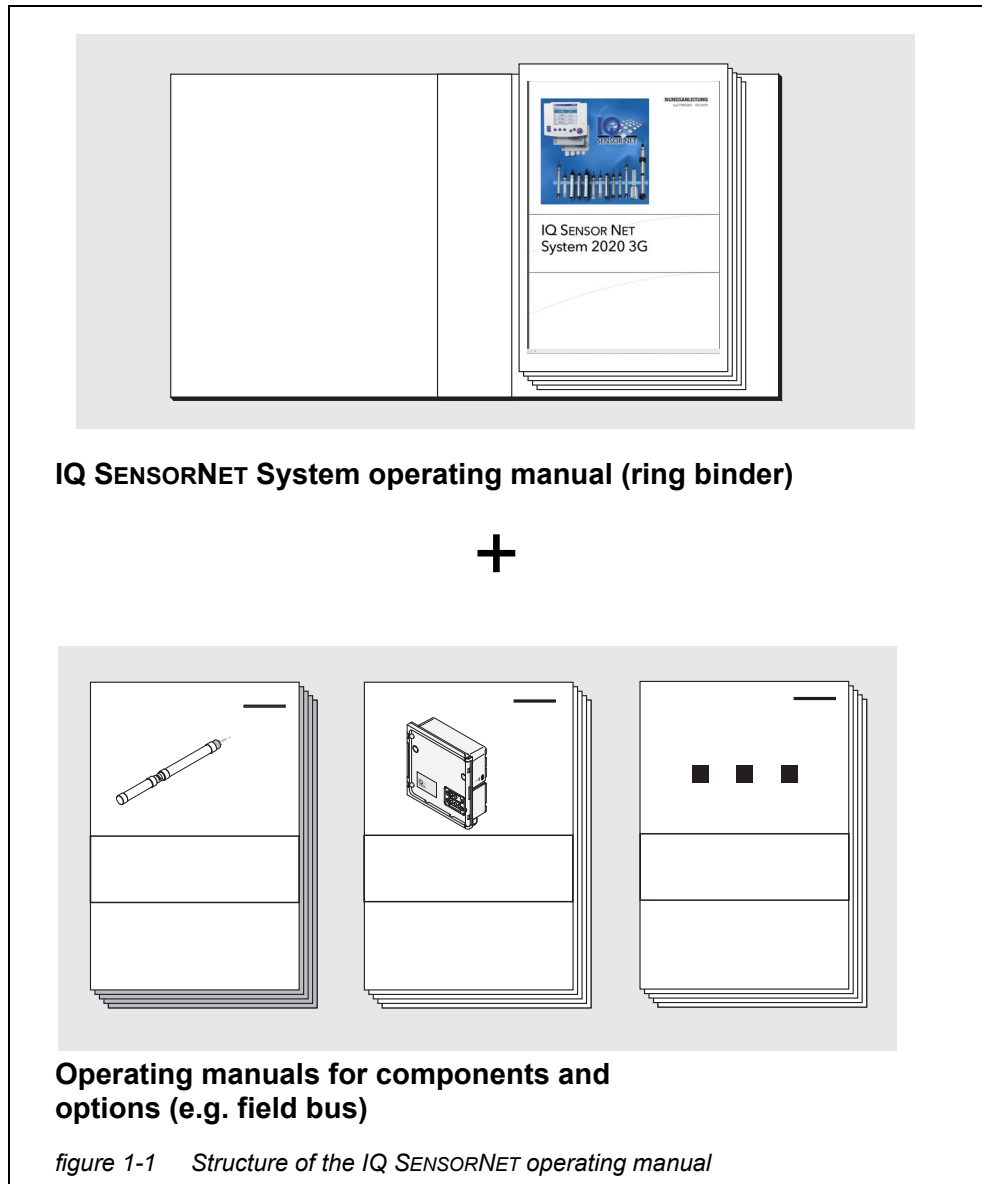
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# 1 Overview

## 1.1 How to use this component operating manual

Structure of the IQ SENSORNET operating manual



The IQ SENSORNET operating manual has a modular structure like the IQ SENSORNET system itself. It consists of a system operating manual and the operating manuals of all the components used. Please file this component operating manual into the ring binder of the system operating manual.



## 1.2 Metrological basics PO4-P, PO4

<b>Phosphate</b>	The salts of the phosphoric acid are called phosphates. With simple phosphoric acid (orthophosphoric acid, H <sub>3</sub> PO <sub>4</sub> ) this is orthophosphate (anion PO <sub>4</sub> <sup>3-</sup> ).
<b>Measuring method</b>	The Alyza IQ PO4 analyzer measures the concentration of orthophosphate in an aqueous solution with the aid of the vanadate molybdate method (yellow method). The reagent contains an aqueous solution of ammonium monovanadate NH <sub>4</sub> VO <sub>3</sub> and ammonium heptamolybdate (NH <sub>4</sub> ) <sub>6</sub> Mo <sub>7</sub> O <sub>24</sub> with an addition of sulfuric acid H <sub>2</sub> SO <sub>4</sub> . In an acidic environment, the chemical reaction takes place according to the following molecular formula: $\text{PO}_4^{3-} + 2 \text{VO}_3^- + 10 \text{MoO}_4^{2-} + 20 \text{H}^+ \rightarrow [\text{PV}_2\text{Mo}_{10}\text{O}_{40}]^{5-} + 10 \text{H}_2\text{O}$ The originally pale yellow reagent will turn a deep yellow. The change of absorbance is photometrically measured at a wavelength of 400 nm. From this, the concentration of orthophosphate is calculated.
<b>Citation forms</b>	Phosphate concentration is quoted in milligrams per liter (mg/l). This value can either refer to all orthophosphate ions or to the phosphorus atom included in them. The values can be converted as follows: <ul style="list-style-type: none"> <li>● 1 mg/l P = 3.066 mg/l PO4</li> <li>● 1 mg/l PO4 = 0.3261 mg/l P</li> </ul> Concentration values referring to the phosphorus atom are indicated by the addition PO4-P (citation form).

## 1.3 Product description

### 1.3.1 Overview

**Application** Analyzers of the Alyza IQ series are designed for online measurements in aqueous samples.

Variant	Measurement
Alyza IQ PO4	Orthophosphate measurements e.g. Measurements for regulation of precipitant dosing in waste water treatment plants Measurements in the final effluents of waste water treatment plants Measurements for water body and river monitoring

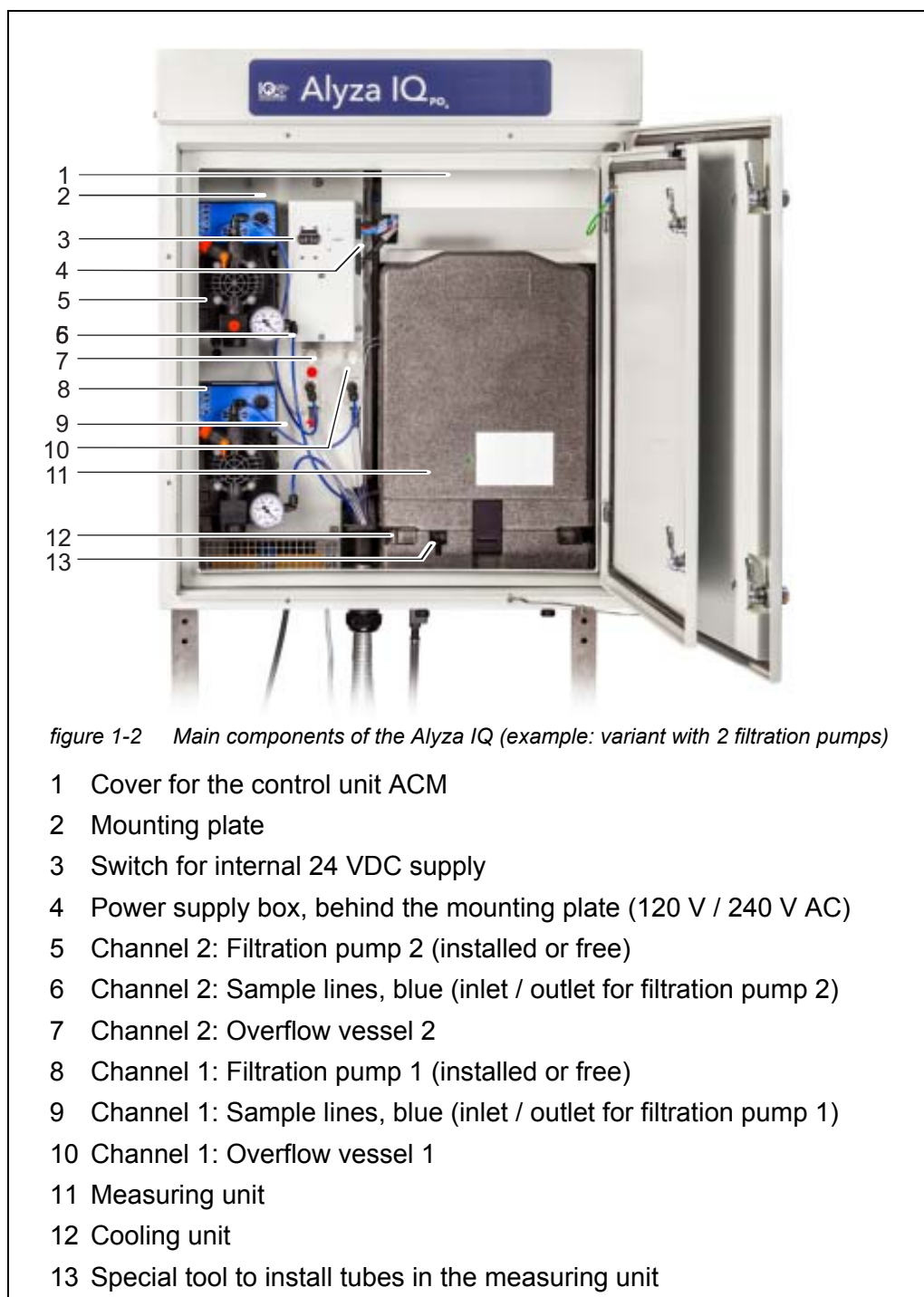
Measurement takes place photometrically, at adjustable intervals, including automatic sampling (sample filtration and sample feed).

**Measuring system** Analyzers of the Alyza IQ series are operated as "sensors" in the IQ SENSORNET.

The following components are required for operation of the Alyza IQ:

Component / function	Explanation
Sensor	The Alyza IQ analyzer is an IQ SENSORNET sensor with special functions.
Controller, terminal connection module	<p>For controlling, and to display the measured values, the Alyza IQ requires a functioning IQ SENSORNET system.</p> <p>IQ SENSORNET - minimum configuration, e.g.</p> <ul style="list-style-type: none"> <li>● 1 DIQ/S 28x</li> </ul> <p>or:</p> <ul style="list-style-type: none"> <li>● 1 terminal/controller (e.g. MIQ/TC 2020 3G) for operation and display of measured values</li> <li>● 1 MIQ/JB module to establish the connection between the terminal/controller and sensor</li> </ul>
Mounting	<p>The Alyza IQ must be safely mounted for operation. The following mounting variants are available:</p> <ul style="list-style-type: none"> <li>● Wall mounting assembly (WM)</li> <li>● Railing support mounting (RM)</li> <li>● Mounting stand (SM)</li> </ul>
<p>Sample filtration, sampling</p> <ul style="list-style-type: none"> <li>● Sample feed</li> <li>● Sample filtration</li> <li>● Lines for the transport of liquids, with heat tracing</li> </ul>	<p>Alyza IQ variant with filtration pumps (1 or 2) to feed the sample to the instrument or The sample is externally taken and made available inside the Alyza IQ.</p> <p>Filtration module (FM/PC) with frame and filter plate</p> <p>Lines with heat tracing for 1 x or 2 x intake line (SH - ...), 1 x return line (RH - ...) and, if necessary, 1 x waste collection line</p>

**Instrument design** Abb. 1-2, 11 shows the mains components of the Alyza IQ.



The measuring unit (11) includes the following components

- Front cover with light duct for the status LED of the measuring unit
- Control unit (ACS)
- Locking device of the MultiPort valve (MPV)
- MultiPort valve (MPV)
- Photometer unit
- Chemicals (ChemBags)

**Temperature control**

For correct measurements, the operating temperature of the Alyza IQ is controlled inside the housing in the following areas.

Range	Temperature control
Housing inside	frost free
Measuring unit	20°C
Photometer unit	45°C

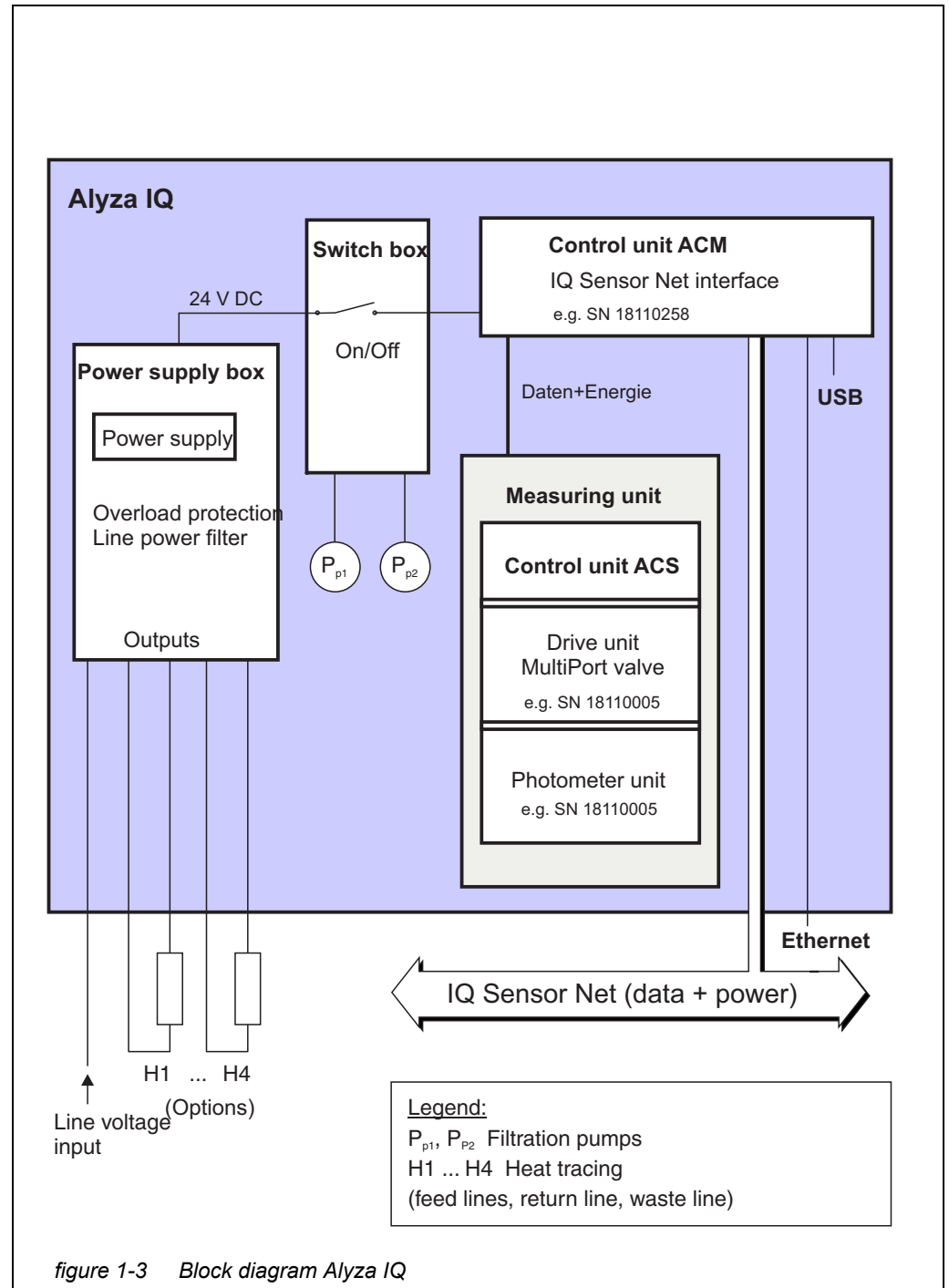
Thus the Alyza IQ with the door closed is suitable for all-season operation in the open. The temperature control is automatically active when the switch on the switch box is in the ON position.



Where there is a chance of frost, the intake line and return line must be provided with a heat tracing in order to maintain the sample feed.

**Power supply and communication**

Abb. 1-3, 13 shows the power supply and communication interfaces of the Alyza IQ.



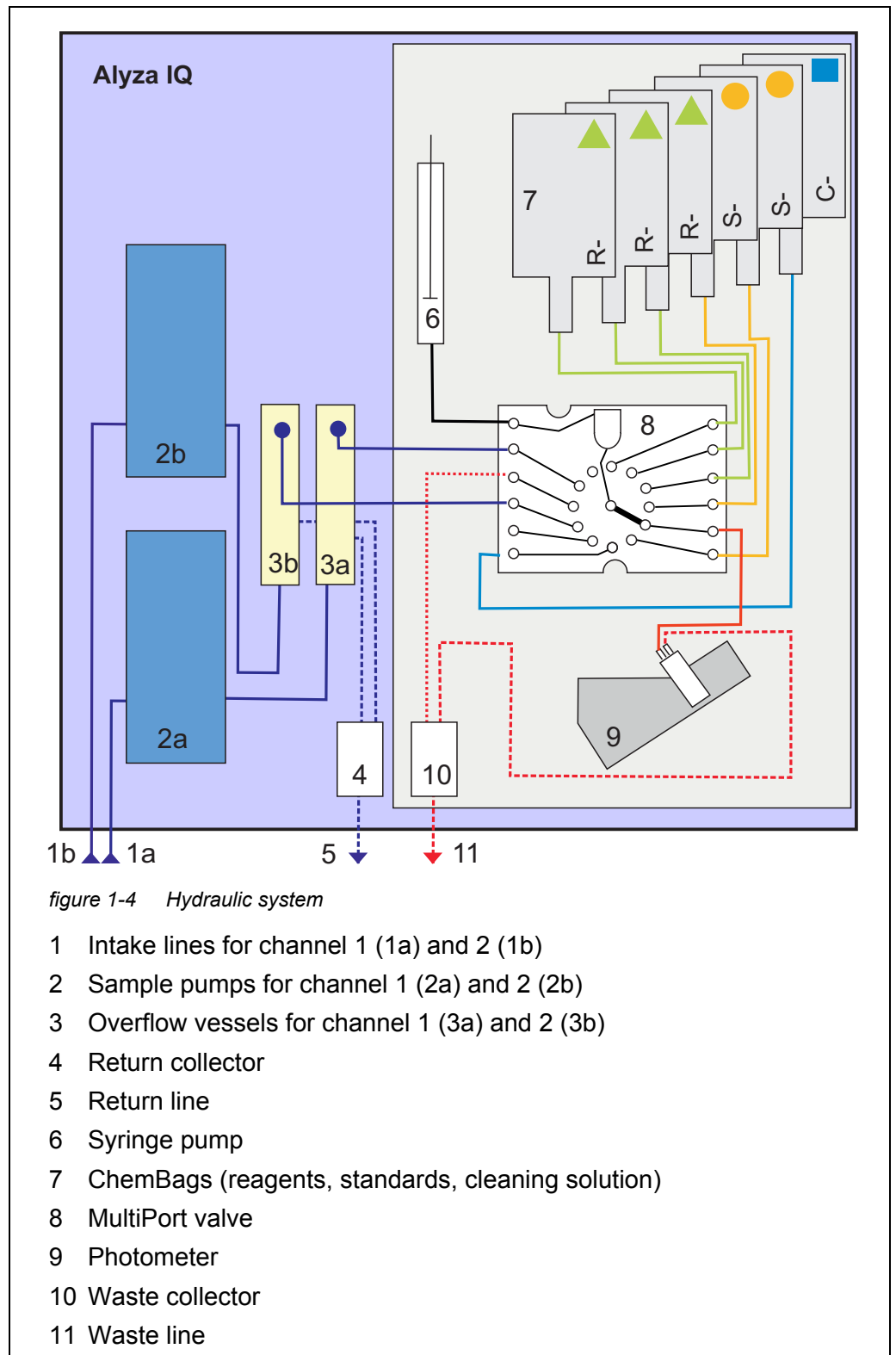
**Operation**

The Alyza IQ is connected to the IQ SENSORNET via the IQ SENSORNET cable (SNCIQ) connected to the control unit ACM and conducted to the outside. The Alyza IQ is operated with a terminal on the IQ SENSORNET. If maintenance activities are being carried out on the open Alyza IQ, a terminal for operation must be installed or docked in the vicinity of the Alyza IQ.



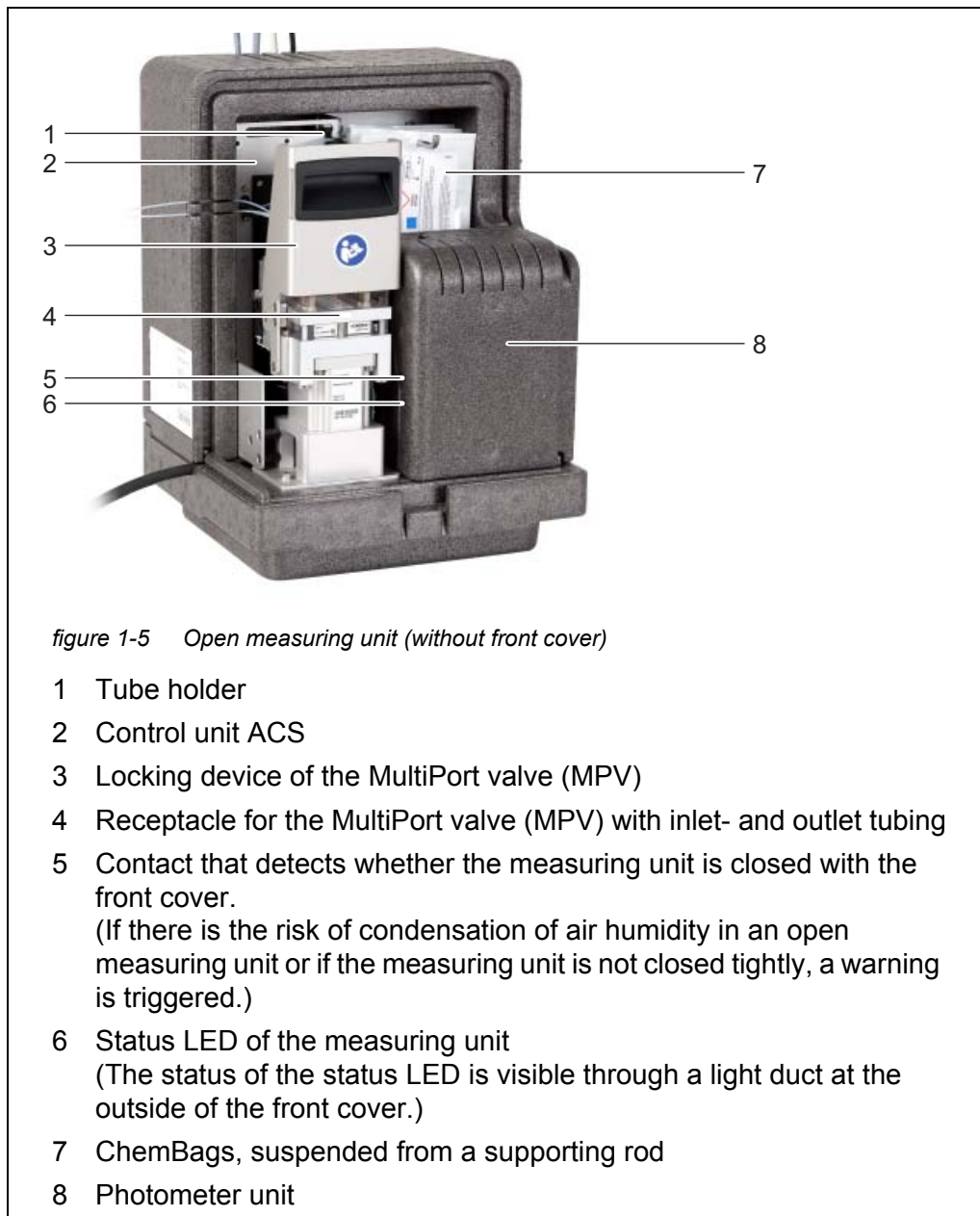
Information on IQ SENSORNET terminals is given in the relevant IQ SENSORNET system operating manual.

**Hydraulic system** Abb. 1-4, 15 shows the hydraulic system of the Alyza IQ.



### 1.3.2 Measuring unit

Abb. 1-5, 16 shows the open measuring unit (without front cover).



**How it functions** The measuring unit is controlled and supplied with DC voltage by the control unit ACM. Communication with the IQ SENSORNET takes place via the IQ SENSORNET cable, as with all other sensors.

In conjunction with the syringe pump, the MultiPort valve (4) controls the movement of the liquids (test sample, reagents, standard solutions, cleaning solution).

The MultiPort valve (4) transports the sample liquid from the overflow vessel into the mixing chamber of the MPV. Filtrated sample continuously flows through the

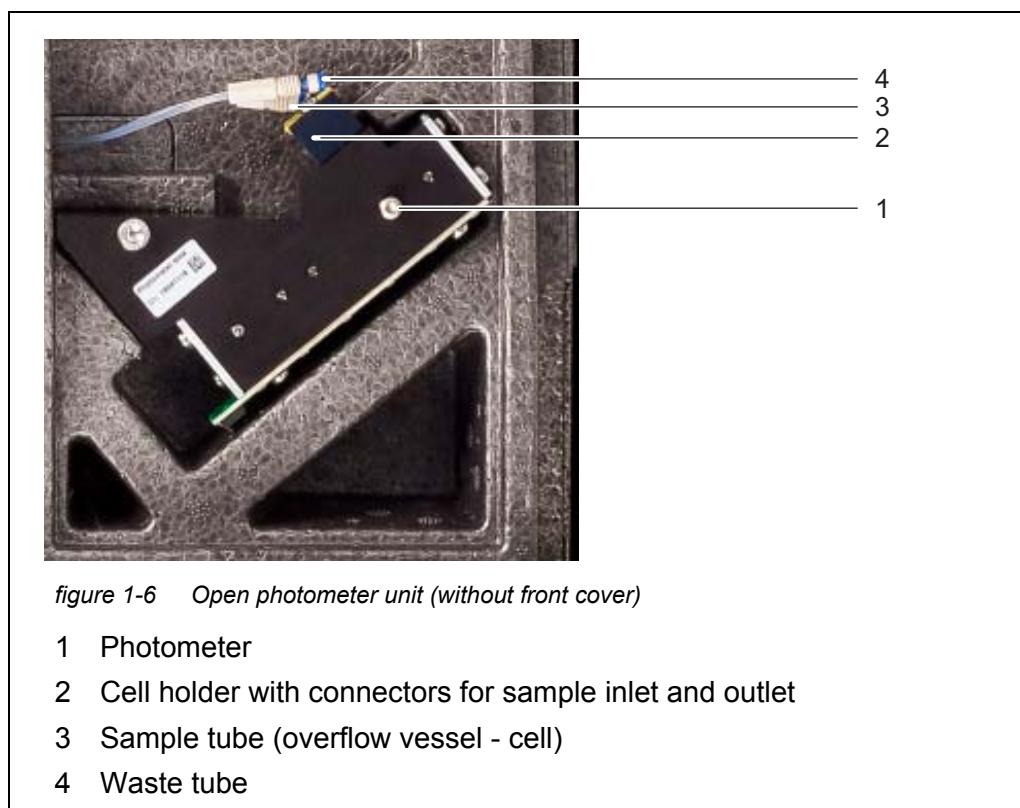


overflow vessel. Thus the sample is constantly available and largely free of air bubbles. The filtration unit (FM/PC - available as an accessory) in conjunction with the filtration pump (instrument variant) provides an optimally prepared sample.

The MultiPort valve (4) transports the reagents to the sample in the mixing chamber. Then the sample is pumped from the mixing chamber into the photometer unit (7).

The absorbance of the reaction mixture is measured in the insulated photometer unit (8). The photometer unit has an LED as the light source and photo diodes as detectors. After the measurement, the liquid is removed from the photometer unit.

Abb. 1-5, 16 shows the open photometer unit (without front cover).



### 1.3.3 ChemBags

The Alyza IQ has an extra counter for each liquid container. The counter counts the consumption of the following procedures as soon as the function is started:

- Measuring
- Calibration
- Cleaning

Other procedures that consume liquids are not counted (e.g. *Fill the system*).



The current counter reading for the ChemBags can be viewed in the Alyza menu (tab *Remaining*).  
In the overview, the remaining time is displayed in days (*Days*).  
You can display more details for each ChemBag with **<OK>**.

If the remaining quantity of a liquid is only approx. 10% of the capacity, a log book message is automatically issued.



*Attention: The remaining times are only correct if the date of expiry was correctly entered.*

Replace the container before the liquid is used up.  
The liquid containers used in the Alyza IQ are aluminum-coated bags (Chem-Bags) containing liquids with a volume of 55 to 170 ml. The liquids (reagents, standards, cleaning solution) are stored in the ChemBags leakproof and airtight. The ChemBags are suspended from a supporting rod with the valves pointing downward.

Installing (even for the first time) and replacing the liquid containers (ChemBags) are maintenance activities, carried out at and documented menu-guided by the Alyza IQ.



Keep the original caps of the ChemBags. They can be screwed on for disposal.

### 1.3.4 Status LEDs

The status LEDs indicate the statuses of the components:

#### Status-LED at the filtration pump

LED	Meaning
Off	No power supply
Green	The filtration pump is ready to operate and waiting for the next action.
Red	The filtration pump is making a pump movement.

#### Status LED at the front cover of the measuring unit

LED	Meaning
Off	No power supply
Red	Error The Alyza IQ is stopped, details see log book

LED	Meaning
Red, flashes quickly  (in addition, a beep is to be heard)	<p>Close the front cover of the measuring unit immediately. Risk of damage due to the formation of condensation water on electronic components within the measuring unit, if the following conditions are met:</p> <ul style="list-style-type: none"> <li>● The outside temperature is warmer by at least 5 °C than the temperature in the measuring unit.</li> <li>● The measuring unit is not closed.</li> </ul> <p>If the measuring unit is opened for longer than 3 minutes, the Alyza IQ is automatically stopped to avoid damage due to condensation.</p>
Green	<p>The measuring unit is in one of the following states:</p> <ul style="list-style-type: none"> <li>– Ready for operation, waiting for the next action</li> <li>– Getting ready for operation (booting up)</li> </ul>
Green, flashes slowly	<p>The measuring unit carries out an action e.g. Measuring, calibrating, cleaning</p>
Blue	<p>The Alyza IQ was stopped manually (by the user). The measuring unit is not (yet) ready to be opened.</p>
White	<p>The Alyza IQ was stopped manually (by the user). The measuring unit is ready to be opened.</p>

### 1.3.5 Instrument variants

The Alyza IQ analyzer is available in different versions. The variant is given in the type designation on the name plate.

#### Structure of the name plate

# Alyza IQ PO4-XYZ

*figure 1-7 Structure of the type designation*

- 1 **X**: Measurement procedure
- 2 **Y**: Measuring range
- 3 **Z**: Number of channels

**Type designation (details)**

Identifier	Values	Variant
<b>X</b> (Variant: measuring procedure)	1	Photometric measurement (yellow method)
<b>Y</b> (Variant: measuring range)	1	Measuring range for low concentrations
	2	Measuring range for higher concentrations
<b>Z</b> (Variant: number of sample channels)	Components (filtration pump and overflow vessel) to supply sample from Z locations (Z = 0, 1, 2, depending on the variant of the Alyza IQ) The number of sample channels can be adapted to meet changed requirements.	
	0	The test sample has to be provided for the measurement by external sampling. Please heed the requirements of the sample.
	1	The test sample is automatically fed from a source and provided for the measurement.
	2	The test sample is automatically fed from two sources and provided for the measurement.

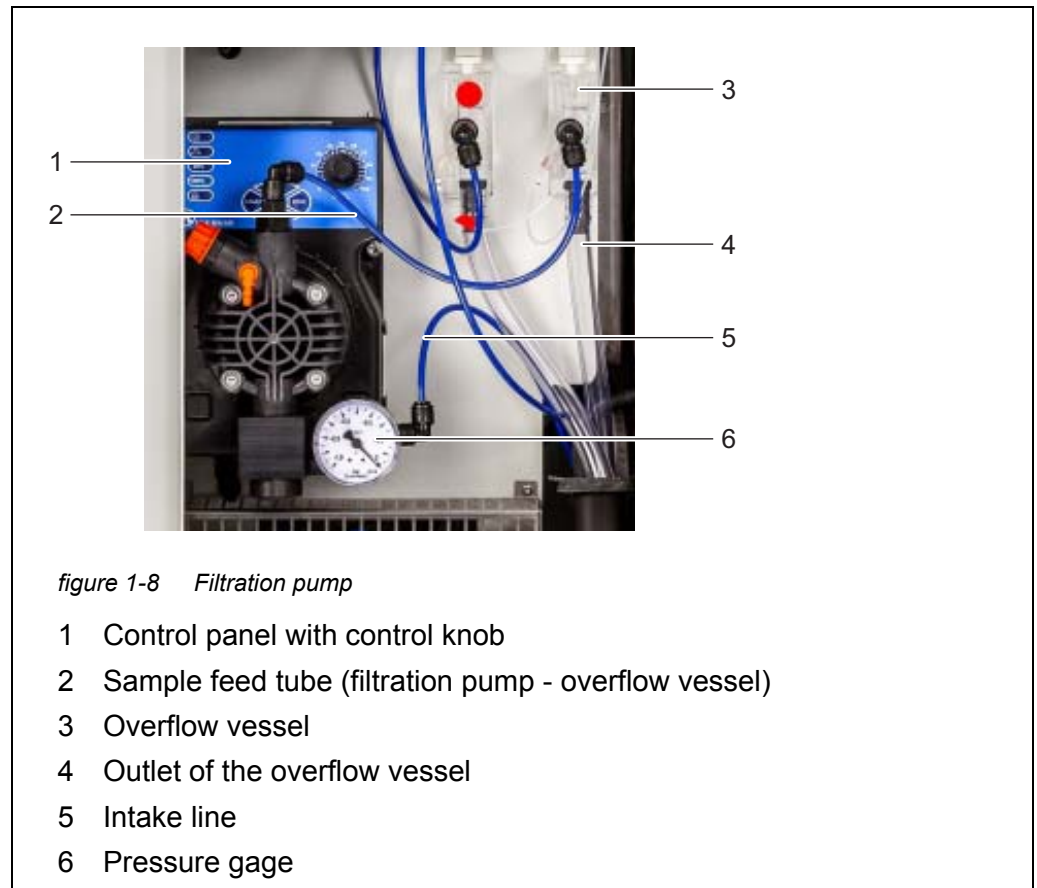


Changing the variants with the identifiers Y and Z is possible by installing or dismantling components.  
Details: see operating manuals of the components.

**Filtration pumps  
(instrument  
variants:  
1 channel or  
2 channels)**

The filtration pump is optimally adjusted to the sample filtration available as an accessory.

Abb. 1-8,  21 shows a filtration pump in the Alyza IQ.



The filtration pump continuously draws sample through the intake line (5) and pumps it into the overflow vessel (3) through the sample feed tube (2). The flow rate can be set with the control knob on the control panel (1). On the intake side, a manometer (6) is installed for low pressure measurement.

To provide sample liquid with the required quality, it is necessary to use a suitable sample filtration (available as an accessory).

### 1.3.6 Sample filtration (accessory) with intake line

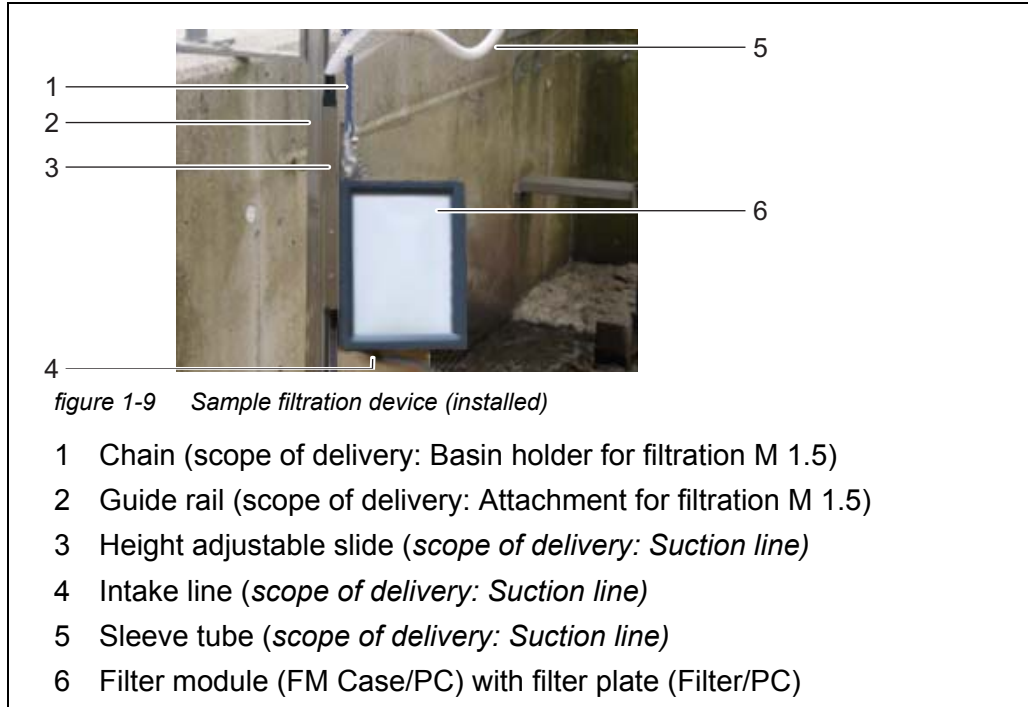
To separate the particles in the sample, the preassembled filter module FM/PC is available as an accessory. It is connected to the Alyza IQ via an intake line. The filtration pump in the Alyza IQ draws in the filtered sample.

The preassembled filter module (FM/PC) consists of a separable PVC frame (FM Case/PC) and a filter plate (Filter/PC). With the aid of the M 1.5 basin attachment for filtration, the FM filter module FM/PC can be immersed in the measuring medium and can be adjusted in height. To clean the filter plate, the filter unit can be pulled out along a guide rail with a chain.

The intake line is in a robust sleeve tube. Intake lines are available in different lengths and with auxiliary heating to protect against frost (depending on the line

voltage).

Abb. 1-9, 22 shows an application example in a sedimentation tank.



The return line directs out of the analyzer housing the overflowing sample from the overflow vessel and the waste solution from the photometer unit. Return lines with heat tracing are available for frost protection.



Order information on accessory items  
(see section 5.2 Replacement parts, accessories, 98)

### 1.4 Name plates

The following components have name plates:

Component	Place of the name plate
Total Alyza IQ	center, on the left-hand inside housing wall
Measuring unit	outside, on the left rear side of the measuring unit and on the front of the MPV drive unit
Photometer	at the photometer
MultiPort valve (MPV)	on the side of the MPV
Mounting plate	on the right-hand side of the switch box
Intake-/return line	at the end of the line (toward the Alyza IQ )



Keep the series numbers on the name plates ready for any service requests.

The serial numbers of the following components can also be queried via the *Info* menu:

- *Serial number of control unit ACM*
- *Serial number of measuring unit*
- *Serial number of photometer*
- *Serial number of MPV*


## 2 Safety instructions


### 2.1 Safety information

#### 2.1.1 Safety information in the operating manual

This operating manual provides important information on the safe operation of the product. Read this operating manual thoroughly and make yourself familiar with the product before putting it into operation or working with it. The operating manual must be kept in the vicinity of the product so you can always find the information you need.

Important safety instructions are highlighted in this operating manual. They are indicated by the warning symbol (triangle) in the left column. The signal word (e.g. "CAUTION") indicates the level of danger:

	<p><b>WARNING</b>  indicates a possibly dangerous situation that can lead to serious (irreversible) injury or death if the safety instruction is not followed.</p>
---	--

	<p><b>CAUTION</b>  indicates a possibly dangerous situation that can lead to slight (reversible) injury if the safety instruction is not followed.</p>
---	--

**NOTE**

*indicates a situation where goods might be damaged if the actions mentioned are not taken.*

#### 2.1.2 Safety signs on the product

Note all labels, information signs and safety symbols on the product. A warning symbol (triangle) without text refers to safety information in this operating manual.

#### 2.1.3 Further documents providing safety information

The following documents provide additional information, which you should observe for your safety when working with the measuring system:

- Operating manuals of other components of the IQ SENSORNET system (power packs, controller, accessories)
- Labels on the chemical containers
- Safety datasheets of calibration and maintenance equipment (e.g. cleaning solutions).

Safety datasheets provide security relevant information on hazardous materials and mixtures. Carefully read the safety datasheets and follow all instructions. We recommend that you store all datasheets in one folder.



## 2.2 Safe operation

### 2.2.1 Authorized use

The authorized use of the Alyza IQ is its use as a sensor in the IQ SENSORNET. Only the operation and running of the Alyza IQ according to the instructions and technical specifications given in this operating manual is authorized (see chapter 7 Technical data, 137). Any other use is considered unauthorized.

With unauthorized use, the protection type supported by the instrument can be adversely affected.

### 2.2.2 Requirements for safe operation

Note the following points for safe operation:

- The product may only be operated according to the authorized use specified above.
- The product may only be operated under the environmental conditions mentioned in this operating manual.
- The product may only be supplied with power by the energy sources mentioned in this operating manual.
- The product may only be opened if this is explicitly described in this operating manual (example: connecting electrical lines to the terminal strip).

### 2.2.3 Unauthorized use

The product must not be put into operation if:

- it is visibly damaged (e.g. after being transported)
- it was stored under adverse conditions for a lengthy period of time (storing conditions, see chapter 7 Technical data, 137).

## 2.3 User qualification

<b>Target group</b>	The IQ SENSORNET system was developed for online analysis. Some maintenance activities, such as exchanging the ChemBags or tubes, require the safe handling of chemicals. Thus, we assume that the maintenance personnel is familiar with the necessary precautions to take when dealing with chemicals as a result of their professional training and experience.
<b>Special user qualifications</b>	The following installation activities may only be performed by a qualified electrician: <ul style="list-style-type: none"><li>● Connecting power cables to the line power supply and the line power box.</li><li>● Connecting the heat tracing lines to the connectors of the line power box</li></ul>

## 2.4 Personal protective equipment (PPE)

The PPE includes clothing and other equipment that is used to protect you against risks at your place of work. You must always wear your PPE while doing dangerous jobs to avoid injuries or damage to your health.

The following table shows the PPE that is required while dealing with dangerous chemicals such as when exchanging the chemical containers. More information is given on the label of the chemical containers and the relevant safety data-sheets.





Personal protective equipment	Typical examples
Protective clothing with long sleeves	
Protective goggles	
Chemical resistant gloves	
Safety shoes	

figure 2-1 Personal protective equipment



It is the duty of the operator to provide all users with the required PPE. The PPE must fulfill the national standards and laws.

## 3 Commissioning

### 3.1 IQ SENSORNET system requirements

#### Software versions of the controller and terminal components

The operation of the Alyza IQ requires the following software versions in the IQ SENSORNET:

MIQ/MC2	Version 3.79 or higher
MIQ/TC 2020 XT	Version 3.79 or higher
MIQ/MC3	Version 3.79 or higher
MIQ/TC 2020 3G	Version 3.79 or higher
DIQ/S 28X	Version 3.79 or higher

### 3.2 Scope of delivery

#### 3.2.1 Scope of delivery of the Alyza IQ

The following parts are included in the scope of delivery of the Alyza IQ:

- Housing (Alyza IQ PO4-XYZ) with mounted and wired installations and mounted power cable (approx. 2 m)
- Key for outer housing door
- Switch cabinet key for interior door
- Cover plate for the control unit ACM
- Bug screen (mounting set)
- Collection funnel (mounting set)
- 2 single tubes
  - Tube to connect the ChemBag for standard 2 to the MPV: It needs to be installed if the function 2-point calibration is selected.
  - Tube to connect the ChemBag for reagent B to the MPV: It needs to be installed if the function *Backgr. corr.(opt)* is selected.
- Operating manual

Check whether the scope of delivery is complete before starting the installation.

#### 3.2.2 Accessories required in addition

Depending on the application, the following additional accessories are required or recommended for operation. We explicitly recommend that you use original YSI accessories:

#### Mounting accessories

The mounting accessories include all parts required for the mounting type selected (screws, washers, springs, nuts) and thus make sure that the instrument is safely mounted at the measuring location. The following variants are

available:

- Rail mount RM
  - Wall mount WM
  - Stand mount SM
- Mount for a terminal**
- Mount TM for fastening and operation of an MIQ module, e.g. MIQ/JB and terminal/controller MIQ/TC 2020 328G or DIQ/S 28x
- Chemicals**
- Reagent solution (R-...) suitable for measured parameter and measuring range
  - Standard solutions (S-...) suitable for measured parameter, measuring range, and calibration procedure)
  - Reagent solution (C-...) suitable for measured parameter and measuring range
- MultiPort valve**
- MultiPort valve (MPV)
- Sample preparation (filtration)**
- Filter module FM/PC (frame FM Case/PC incl. preassembled filter plate Filter/PC)
  - Basin holder for filtration M 1.5 for frame FM Case/PC, also available with extension M-EXT 1.5
  - Intake line SH ... (different lengths up to 20 m, with and without heat tracing [240 VAC or 120 VAC])
  - Return line RH ... (different lengths up to 20 m, with and without heat tracing [240 VAC or 120 VAC])



Order information referring to accessories is given in section 5.2 Replacement parts, accessories, 98.

### 3.3 Basic principles of installation

#### 3.3.1 Requirements of the measurement location

The measurement location must meet the environmental conditions specified in section 7.3 General data, 139.

**Controlled ambient conditions**

Work on the open instrument (e.g. during mounting, installation, maintenance) may only be carried out under monitored ambient environmental conditions:

Temperature range	+ 5 ... + 40 °C (+ 41 ... +104 °F)
Relative air moisture	≤ 80 %

If the Alyza IQ is already in operation, the temperature of the measuring unit must be adapted to the ambient temperature prior to opening the measuring unit. The temperature adaptation is done with the function *Prepare to open mea-*

*asuring unit. As soon as the measuring unit is ready to be opened, this is displayed in the *Status* tab and the LED of the measuring unit lights up white.*

**NOTE**

*The interior of the measuring unit is temperature-controlled to 20 °C.*

*With ambient temperatures over 25 °C, condensation water may develop on the cool surfaces and cause damage when the measuring unit is opened.*

*To avoid damage of the measuring unit due to the formation of condensation water, always wait for the temperature adjustment (function *Prepare to open measuring unit*) to be completed before opening the measuring unit.*

### 3.3.2 Safety requirements of the electrical installation

The safety of the system into which the instrument is integrated is the responsibility of the builder of the system.

Electrical equipment (e.g. motors, contactors, cables, lines, relays, switches, instruments) must meet the following requirements:

- Compliance with national regulations (e.g. NEC, VDE and IEC)
- Suitability for the electrical conditions at the place of installation
  - Maximum operational voltage
  - Maximum operational current
- Suitability for the ambient conditions at the place of installation
  - Temperature resistance (minimum and maximum temperature)
  - Stability against UV light in the case of outdoor usage
  - Protection against water and dust (Nema or IP type of protection).
- Suitable fuse protection of the electrical circuit
  - Overcurrent protection devices  
(according to the technical data of the instrument input or output)
  - Overvoltage class II surge limiters
- Suitable disconnecting device (e.g. switch or circuit breaker) for the line power supply of permanently mounted equipment with separate line power connection,
  - labeled as disconnecting device for this instrument
  - compliant with the following regulations
    - IEC 60947-1
    - IEC 60947-3
  - in the vicinity of the instruments (recommendation)
- Fault current protection switch (ground fault circuit interrupter) especially with operation of heat tracings
- Flame resistant (cable and lines), compliant with the following regulations

- UL 2556 VW-1 (for USA, Canada)
- IEC 60332-1-2 (outside of USA, Canada)



For details on the conditions at the installation site, see chapter 7 Technical data, ¶ 137.

### 3.3.3 General installation instructions



This section describes the installation of the Alyza IQ with various, especially designed accessories. We assume that the operator uses these accessories. In this section, the individual scopes of delivery are not distinguished so the comprehensibility of the instructions is not affected.

Pay attention to the following points during installation:

- Due to its weight, the Alyza IQ always has to be carried by two people (housing door upward, both people grasping the housing at the upper C rail and at the housing bottom on the side of the door).
- Wear safety shoes for transport, installation and mounting work (see section 2.4 Personal protective equipment (PPE), ¶ 26).
- Installation in the open should be done while the weather is frost-free (see environmental conditions, section 3.3.1 Requirements of the measurement location, ¶ 28).
- Mount the Alyza IQ as straight as possible to ensure that the liquids can drain off optimally.
- Mount the Alyza IQ so that the space under the housing bottom is always free for the ventilation of the housing.
- The Alyza IQ may only be fastened on a wall or fixture with the aid of the two C-rails (housing upright).
- For mounting work, only use the mounting accessories included in the scope of delivery (screws, washers, springs, nuts). This ensures the safe fastening at the mounting location.

**Main steps** Installation of the Alyza IQ includes the following main steps:

- 1 Installing the housing.  
See section 3.3.4, ¶ 31.
- 2 Removing the transport protection of the measuring unit.  
See section 3.3.8, ¶ 44.
- 3 Connecting the cables to the control unit ACM.  
See section 3.3.9, ¶ 45.

- 4 Mounting the cover plate for the control unit ACM.  
See section 3.3.10, [46](#).
- 5 Installing the bug screen and condensate drain adapter.  
See section 3.3.11, [46](#).
- 6 With the relevant accessories:  
Mounting the terminal holder (TM).  
See section 3.3.12, [48](#).
- 7 Mounting the collection funnel.  
See section 3.3.13, [51](#).
- 8 With the relevant accessories:  
Installing the FM/PC filter module and M 1.5 basin holder for filtration.  
See section 3.3.15, [54](#).
- 9 With the relevant accessories:  
Connecting the power cable, heat tracing lines, and tubes.  
See section 3.3.16, [56](#).
- 10 Setting up a connection with the IQ SENSORNET system.  
See section 3.3.18, [66](#).
- 11 Maintenance- and cleaning activities at the measuring unit.  
See section 5.5, [104](#).

### 3.3.4 Installing the housing

The housing of the Alyza IQ can be installed in the following ways:

- On the SM stand mount. See section 3.3.5 Installation on the SM stand mount, [32](#).
- On a rail. See section 3.3.6 Installation on a rail, [37](#).
- On a wall. See section 3.3.7 Installation on a wall, [42](#).



In the housing there is a foam insert serving as a transport protection. Remove the foam insert once the installation of the housing has been completed.

### 3.3.5 Installation on the SM stand mount

Proceed as follows to install the housing on the stand mount:

#### Assembling the stand mount

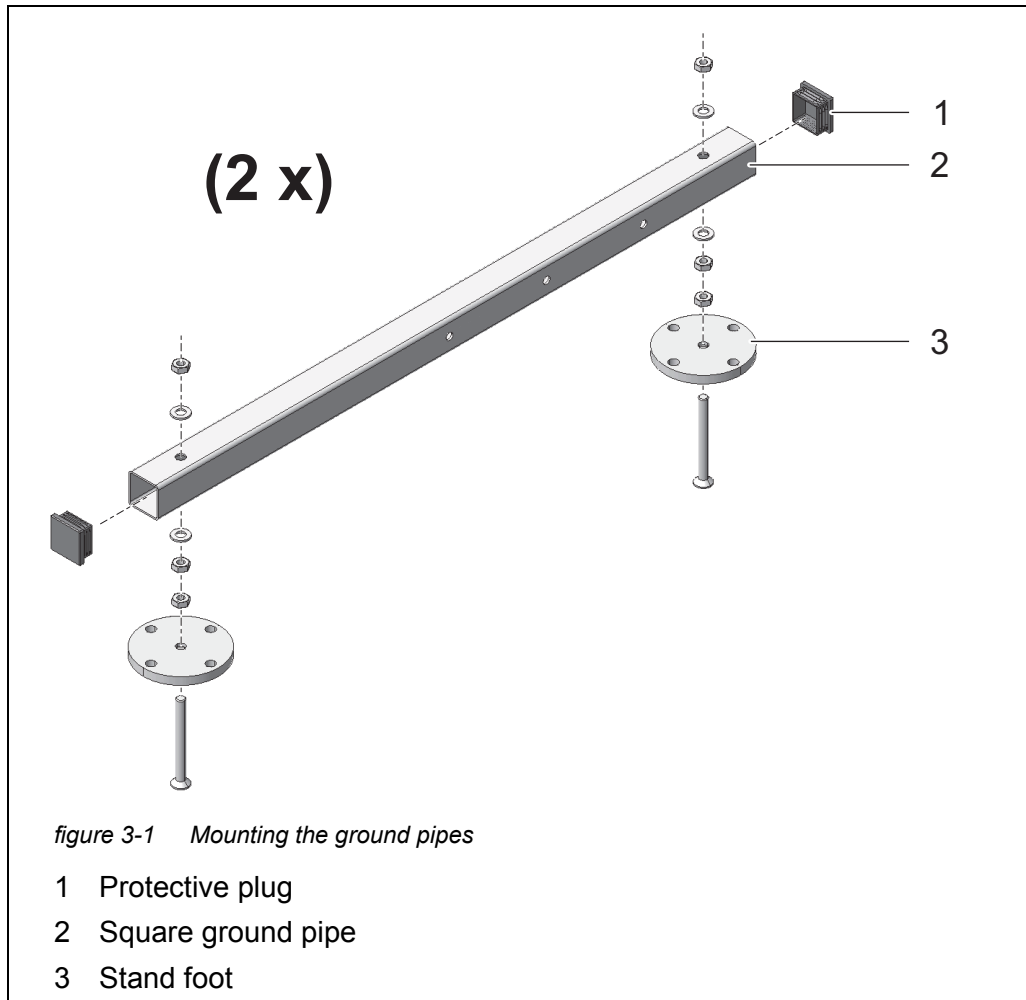
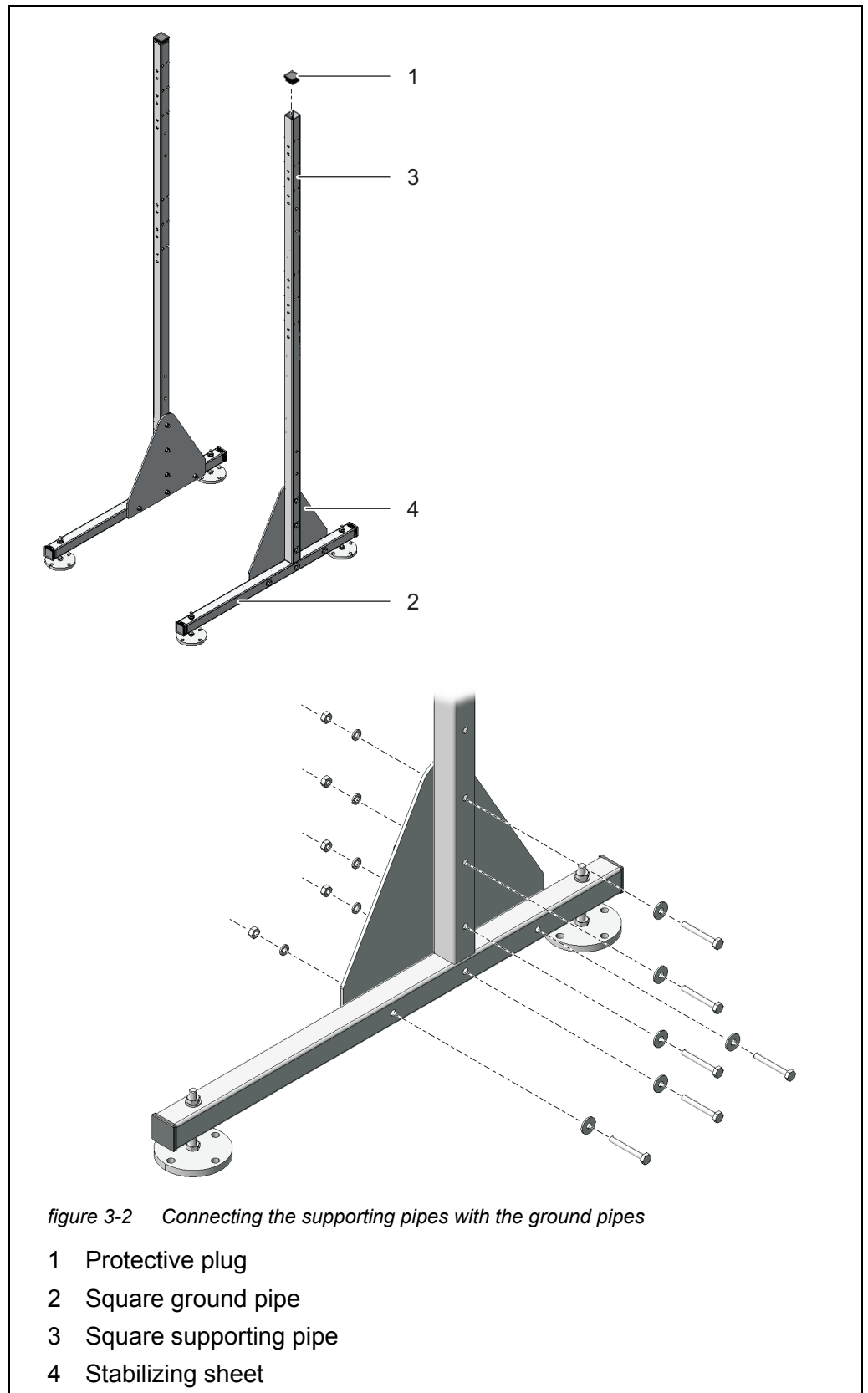


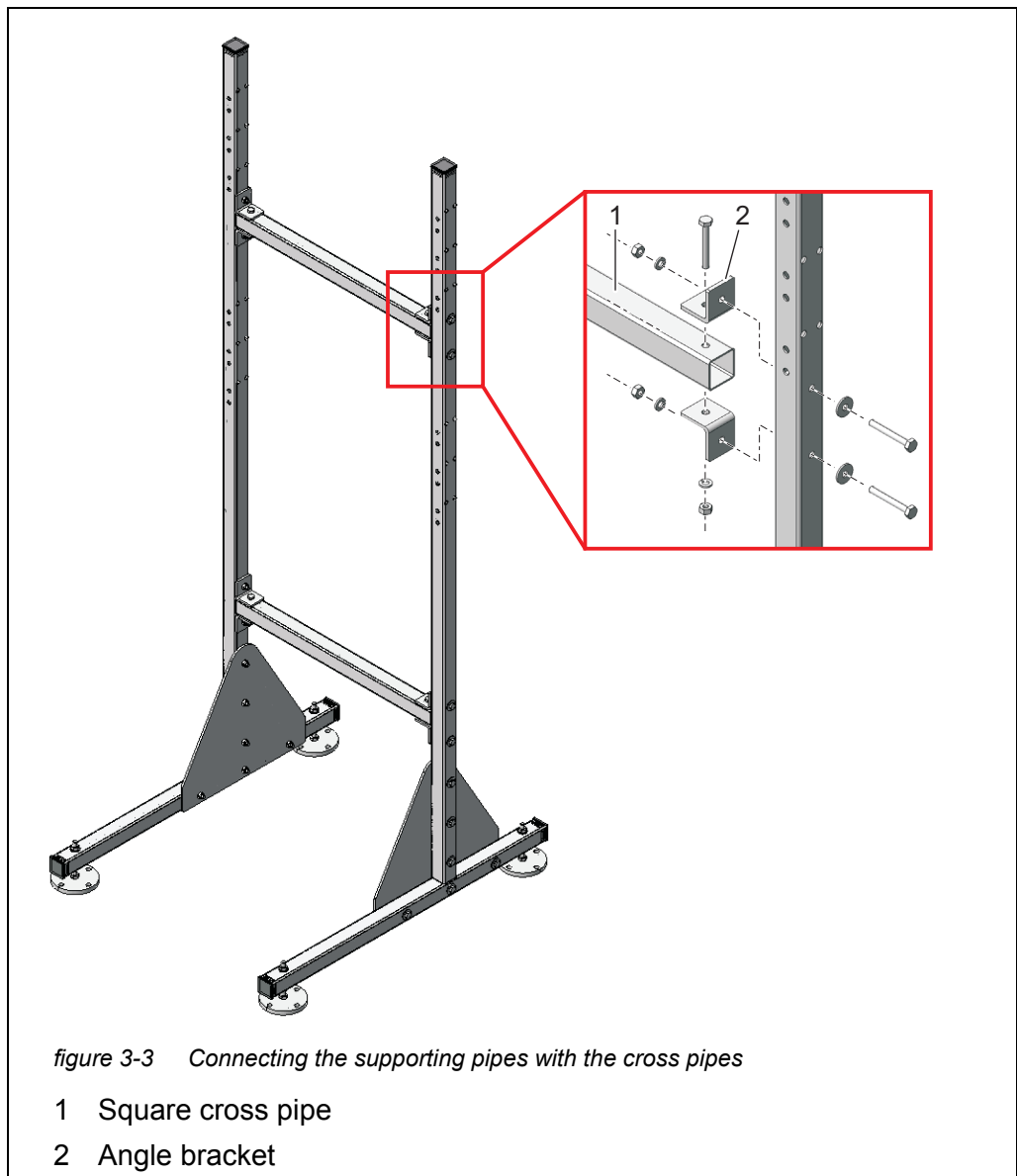
figure 3-1 Mounting the ground pipes

- 1 Press the plastic protective plugs (1) into both ends of the square ground pipes (2).
- 2 Mount the four height adjustable stand feet (3) on the square ground pipes (2) using the enclosed M10 hexagon countersunk head screws. Make sure to use the correct number of plain washers and nuts in the correct order according to Abb. 3-1, 32.





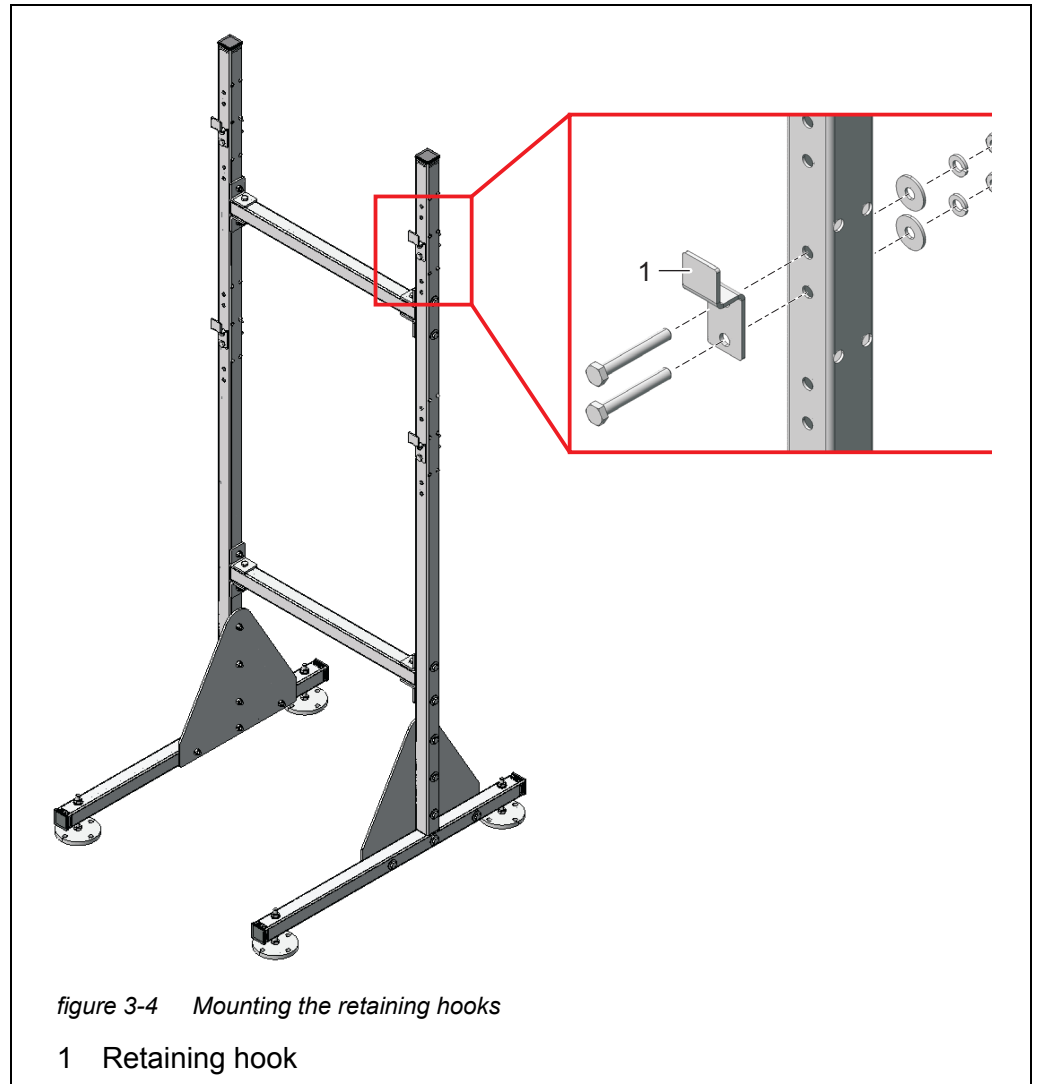
- 3 Press the plastic protective plugs (1) into the upper ends of both square supporting pipes (3).
- 4 Using the triangular stabilizing sheets (4), connect both square supporting pipes (3) with the preassembled ground pipes (2). For each side, use six hexagon head screws with large plain washers, spring washers and locknuts as shown in Abb. 3-2, 33. Make sure the two sides mirror each other after being mounted.



- 5 Connect both supporting pipes with each other using the two square cross pipes (1). For each joint, use two angle brackets (2), three hexagon head screws, two large plain washers, three spring washers and three locknuts.



Make sure that both triangular stabilizing sheets (5) are on the inside.



- 6 Mount the four retaining hooks (1) on the supporting pipes. For each hook, use two hexagon head screws, large plain washers, spring washers and locknuts.



On each side there are three pairs of holes for the upper and lower retaining hooks. Thus the Alyza IQ can be mounted optimally at working level. Use the same relative positions for each of the upper and lower hooks.

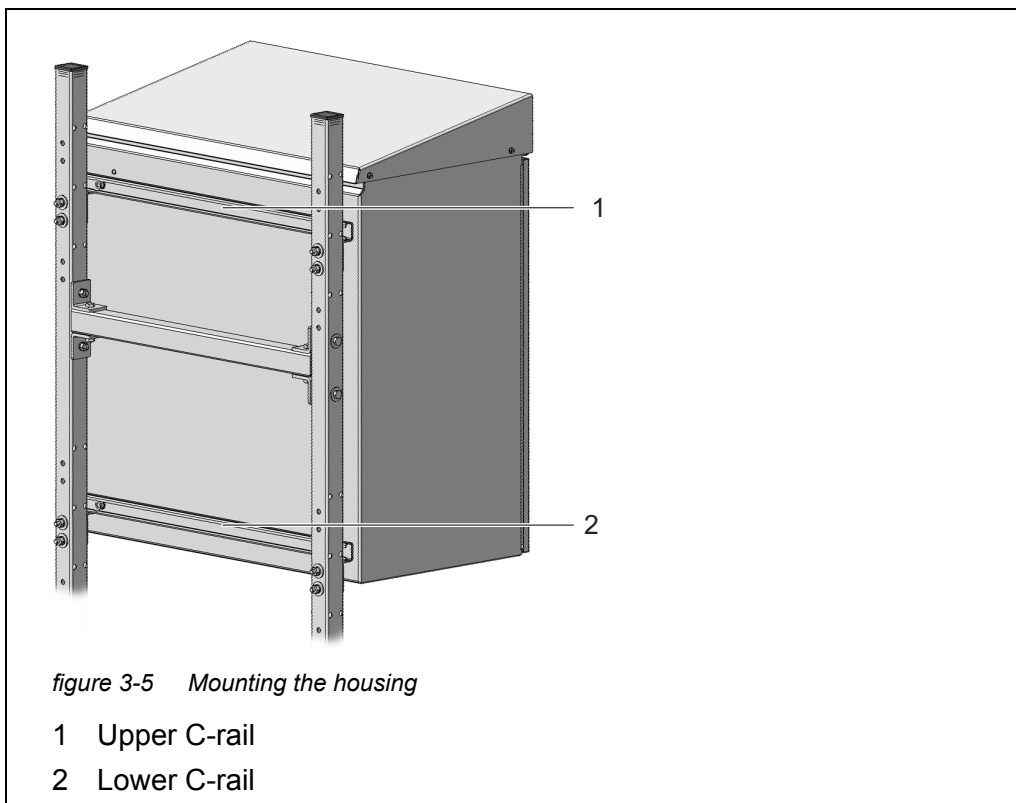
**Positioning the stand mount**

- 7 Place the stand mount at the intended operating location.

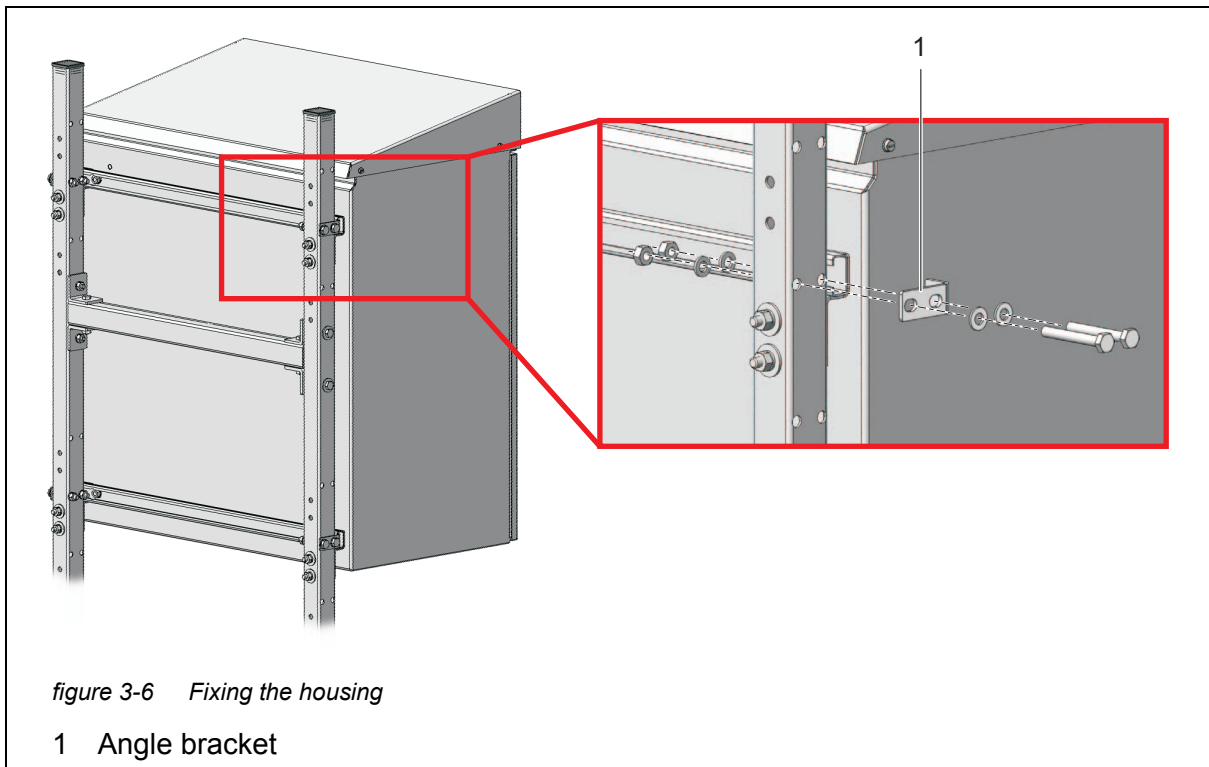
- 8 Adjust the four height adjustable stand feet so that the stand mount stands straight.

**NOTE**

*Always screw the four stand feet to the ground. If the instrument is mounted in the open, please make sure that the installation withstands even severe storm.*

**Mounting the housing**

- 9 Mount the housing by hooking the C-rails (1 and 2) fixed on its rear side into the four retaining hooks of the stand mount.



- 10 Fix the housing on both sides with four brackets (1) so it cannot shift sideways. For each bracket, use two hexagon head screws, small plain washers, spring washers and locknuts.

### 3.3.6 Installation on a rail

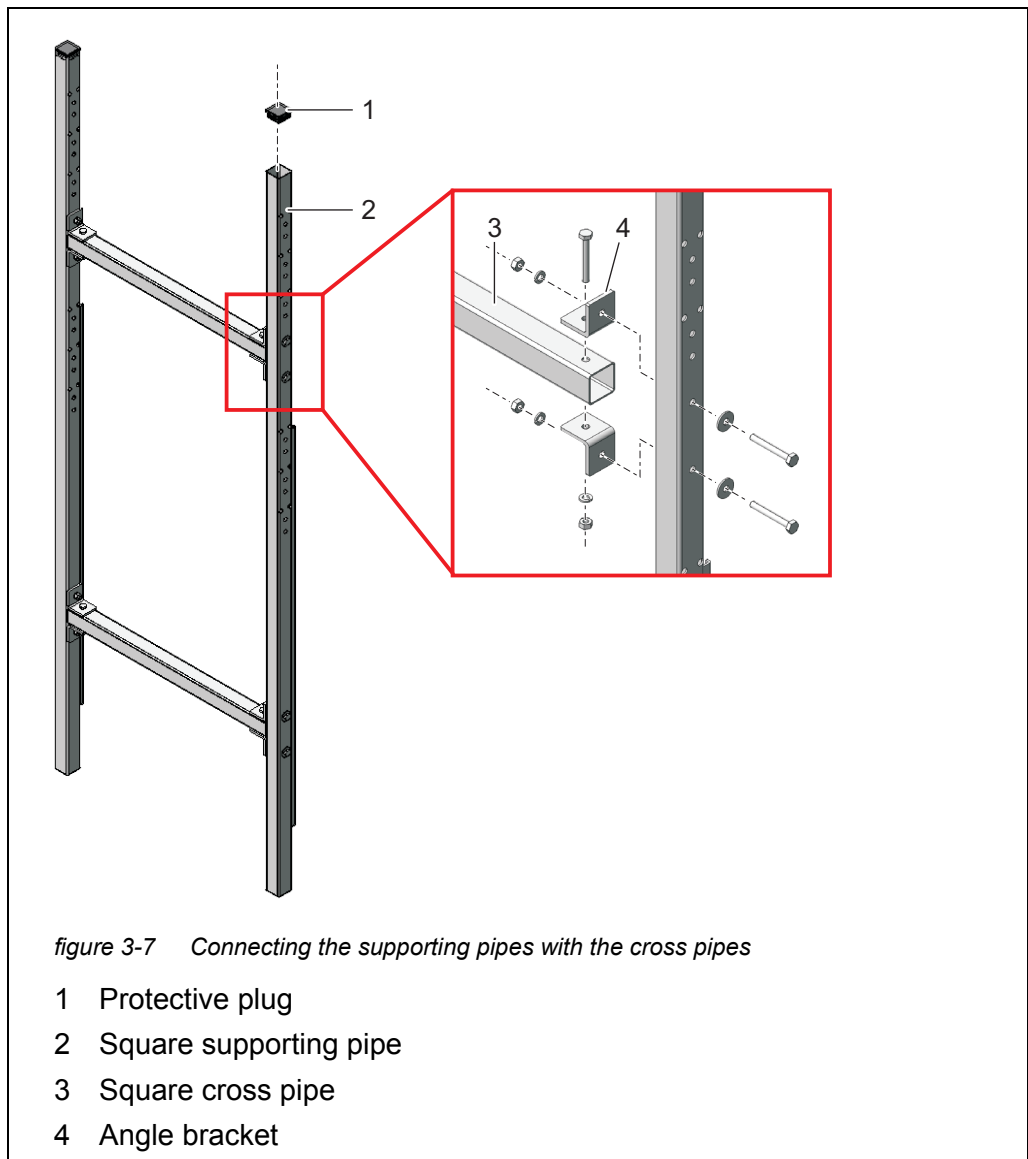
For installation on a rail, the RM rail mount bracket is required.

**NOTE**

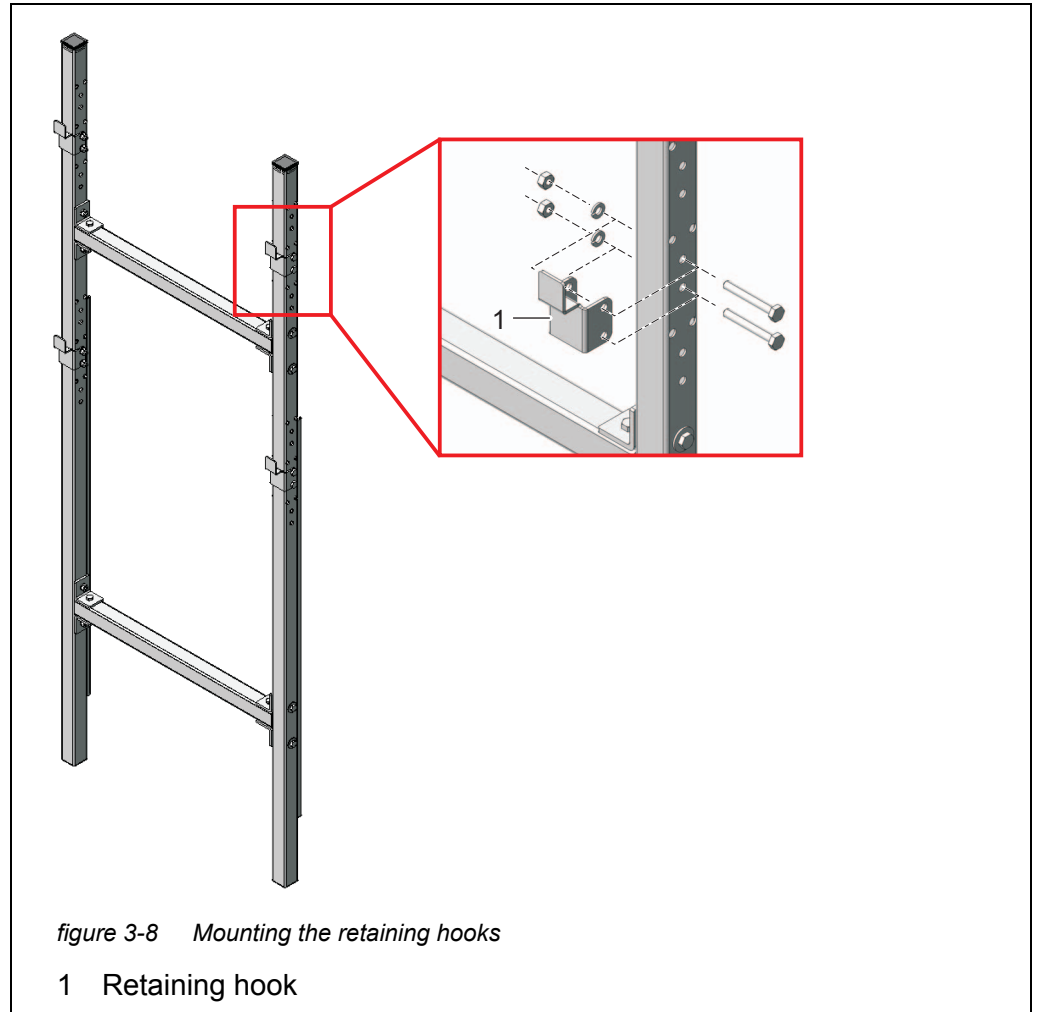
*Make sure that the rail is sufficiently stable. If the instrument is mounted in the open, please make sure that the installation withstands even severe storm.*

**Assembling the bracket**

Proceed as follows to install the housing on the rail:



- 1 Press the plastic protective plugs (1) into the upper ends of both square supporting pipes (2).
- 2 Connect both supporting pipes with each other using the two square cross pipes (3). For each joint, use two angle brackets (4), three short hexagon head screws, two large plain washers, three spring washers and three locknuts as shown in Abb. 3-7, 38.



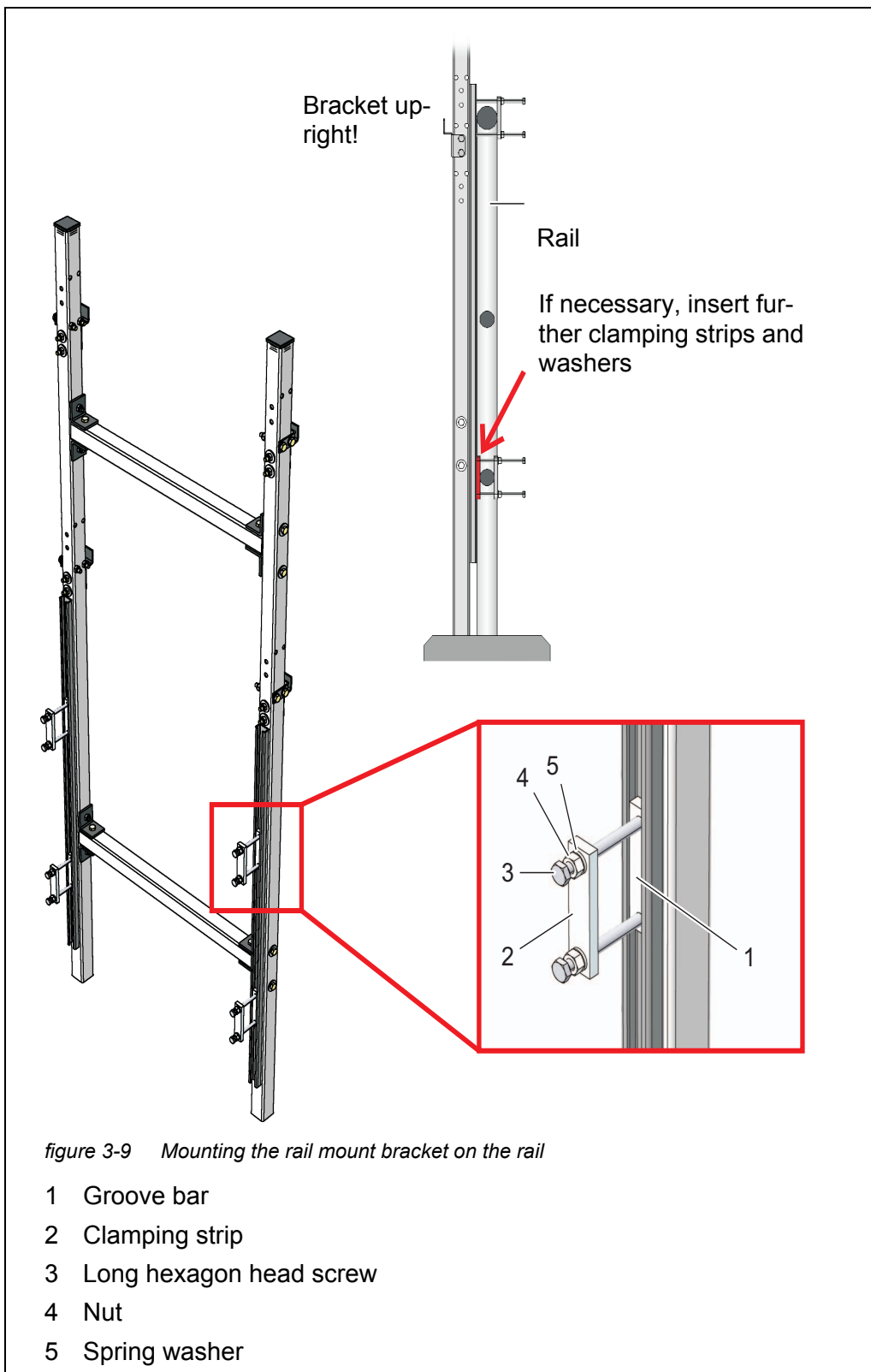
- 3 Mount the four retaining hooks (1) on the supporting pipes. For each hook, use two short hexagon head screws, spring washers and lock-nuts.



There are three pairs of holes each for the upper and lower retaining hooks. Thus the Alyza IQ can be mounted optimally at working level. Use the same relative positions for each of the upper and lower hooks.

#### Fixing the rail mount bracket

- 4 Place the rail mount bracket in front of the rail in the required position.



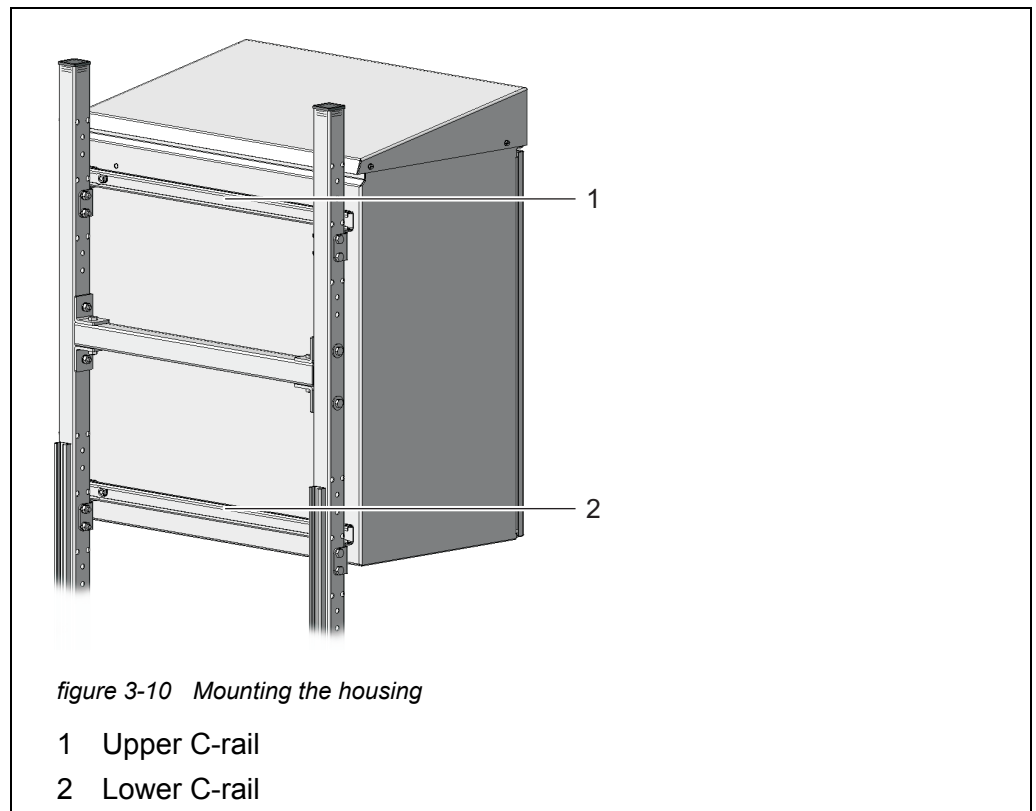


- 5 Attach the rail mount bracket to two suitable horizontal rail pipes with the aid of the four clamping devices. Each clamping device consists of a groove bar (1), a clamping strip (2), two long hexagon head screws (3), two nuts (4) and two spring washers (5). Adjust the clamping devices to the rail pipes. To compensate for any possible differences of the upper and lower rail pipe diameters, 2 further clamping strips and 8 washers (thickness 2 mm) are provided with the construction set. If necessary, insert these items between the rail and supporting pipes as shown in Abb. 3-9, 40 so that the rail mount bracket is in a vertical position. Note that both supporting pipes must stand on the ground!

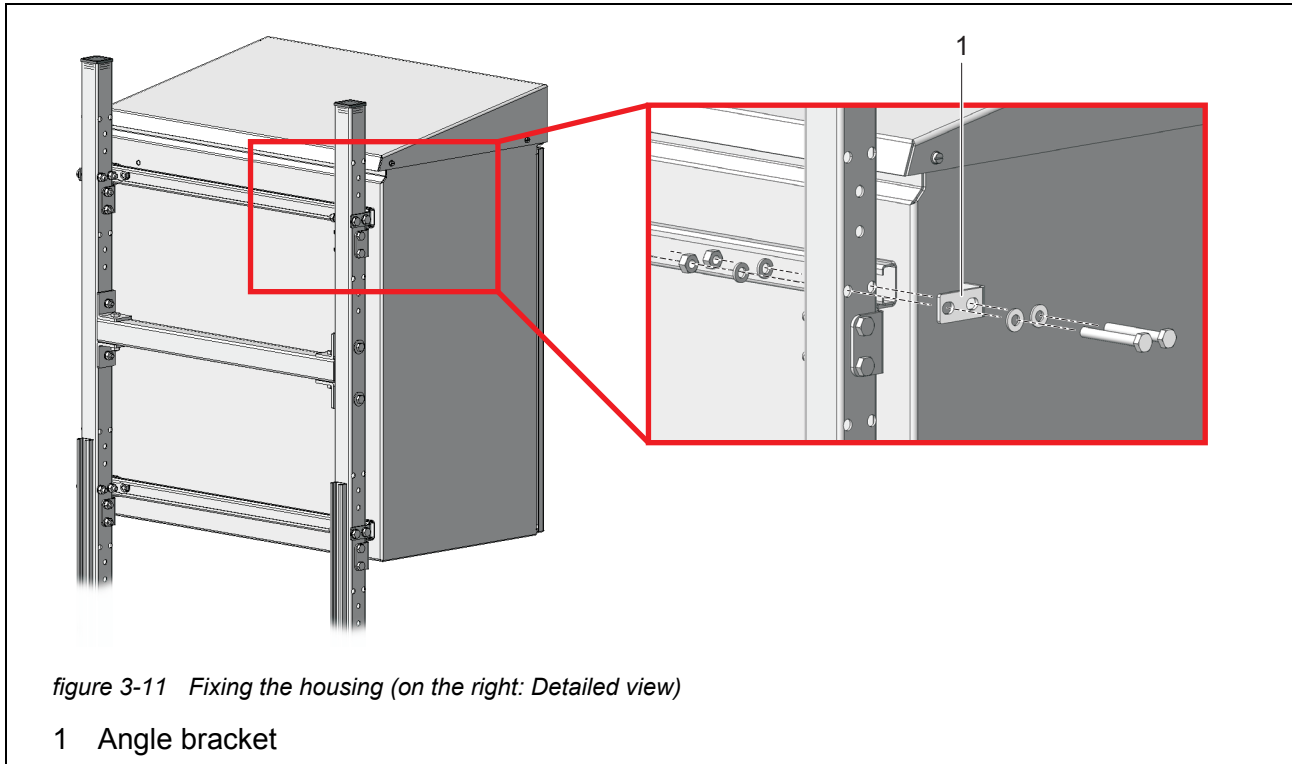


The weight of the Alyza IQ is supported by the rail mount bracket standing on the ground. The rail prevents the Alyza IQ from falling over.

### Mounting the housing



- 6 Mount the housing by hooking the C-rails (1 and 2) fixed on its rear side into the retaining hooks of the rail mount bracket.



- 7 Fix the housing on both sides with four brackets (1) so it cannot shift sideways. For each bracket, use two short hexagon head screws, small plain washers, spring washers and locknuts.

### 3.3.7 Installation on a wall

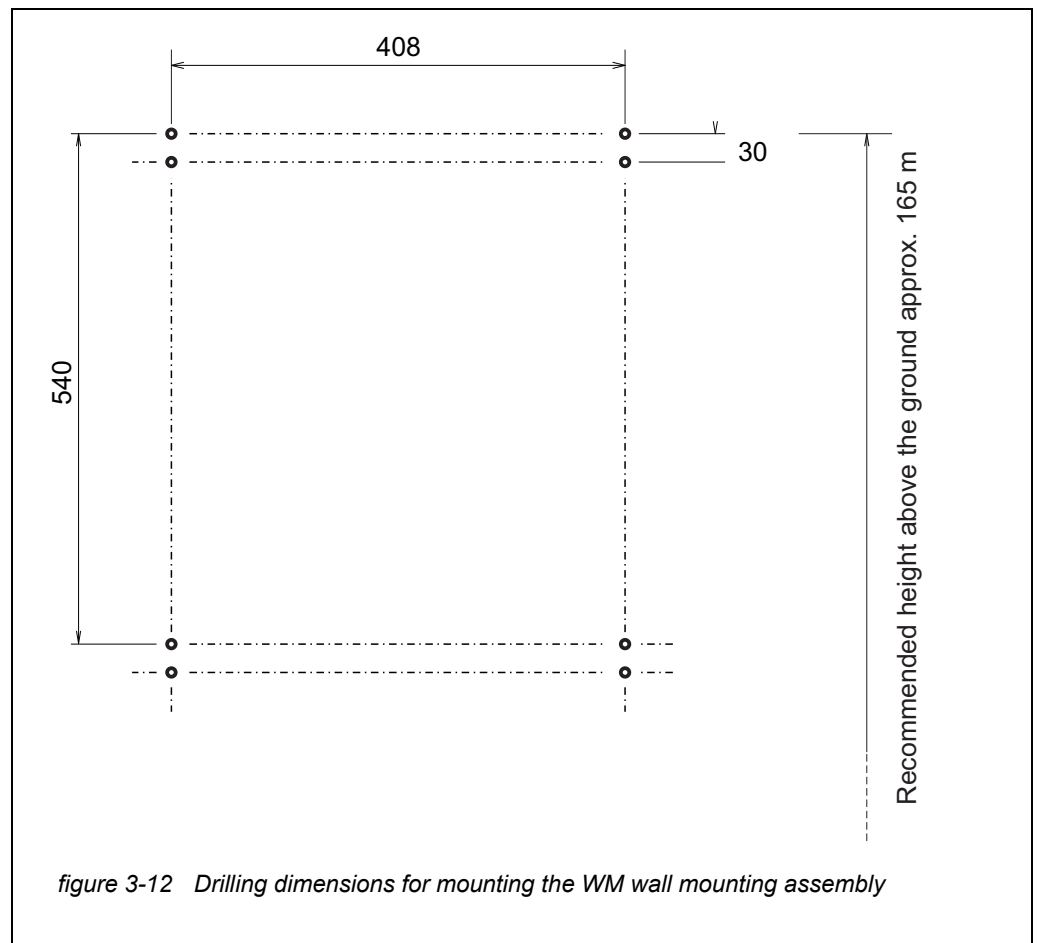
With the C-rails on its rear side, the Alyza IQ is hooked into the retaining hooks of the WM wall mounting set.

**NOTE**

*Make sure that the wall is strong enough for the weight of the Alyza IQ and that the mounting material (screws, plugs, etc.) is suitable for the wall type. If necessary, use other screws and plugs than the ones provided.*

Proceed as follows to install the housing on a wall:

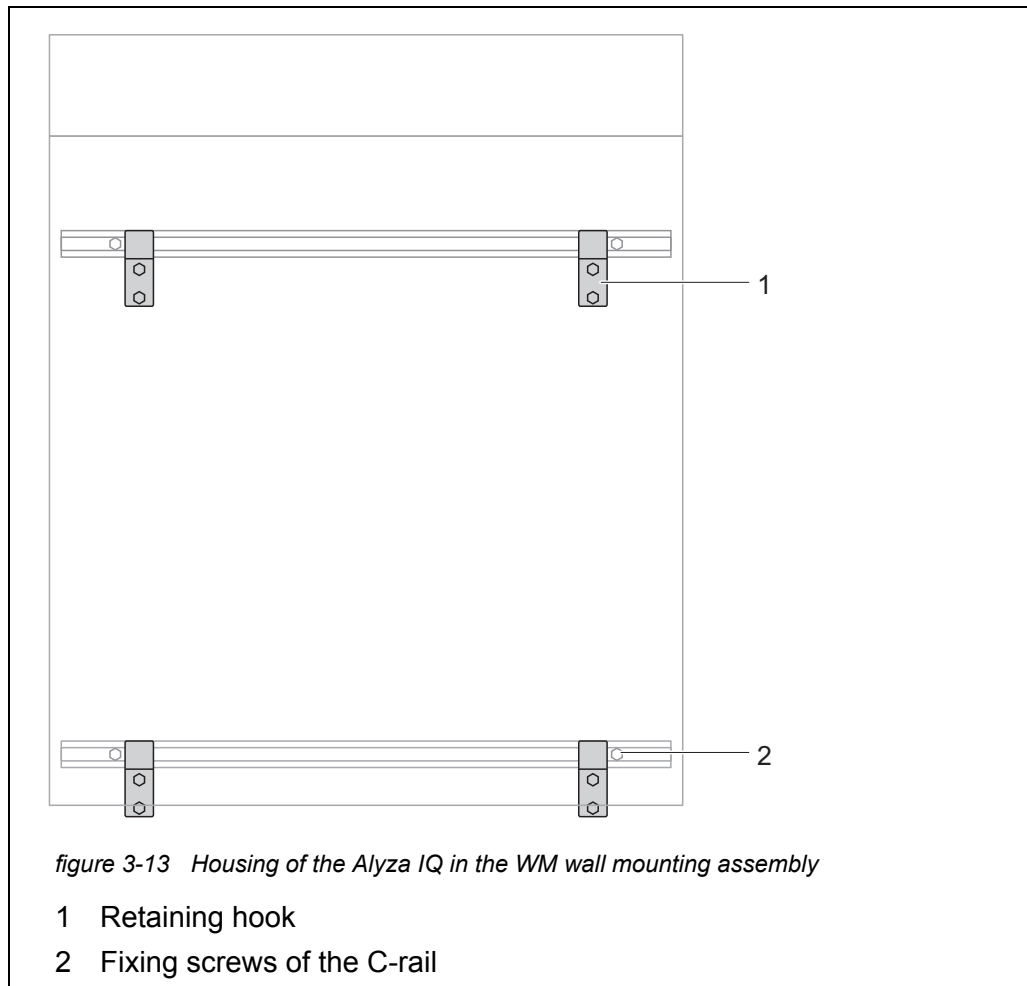
- 1 Drill eight holes as shown in the following figure:



- 2 Screw tight the four retaining hooks of the wall mounting set.
- 3 Mount the housing by hooking the C-rails fixed on its rear side into the four retaining hooks.

**NOTE**

To prevent the instrument from shifting laterally, the fixing screws of the C-rails have to be outside the retaining hooks on both sides (see Abb. 3-13, 44.)



### 3.3.8 Removing the transport protection of the measuring unit

The transport protection in the housing of the Alyza IQ fixes the measuring unit in its position with the aid of 3 spacers made of foam.

- 1 Open the outer housing door far enough so the arrestable brake-stay catches.
- 2 Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.  
3 foam transport protectors are in the area between the control unit (1) and the measuring unit (5).

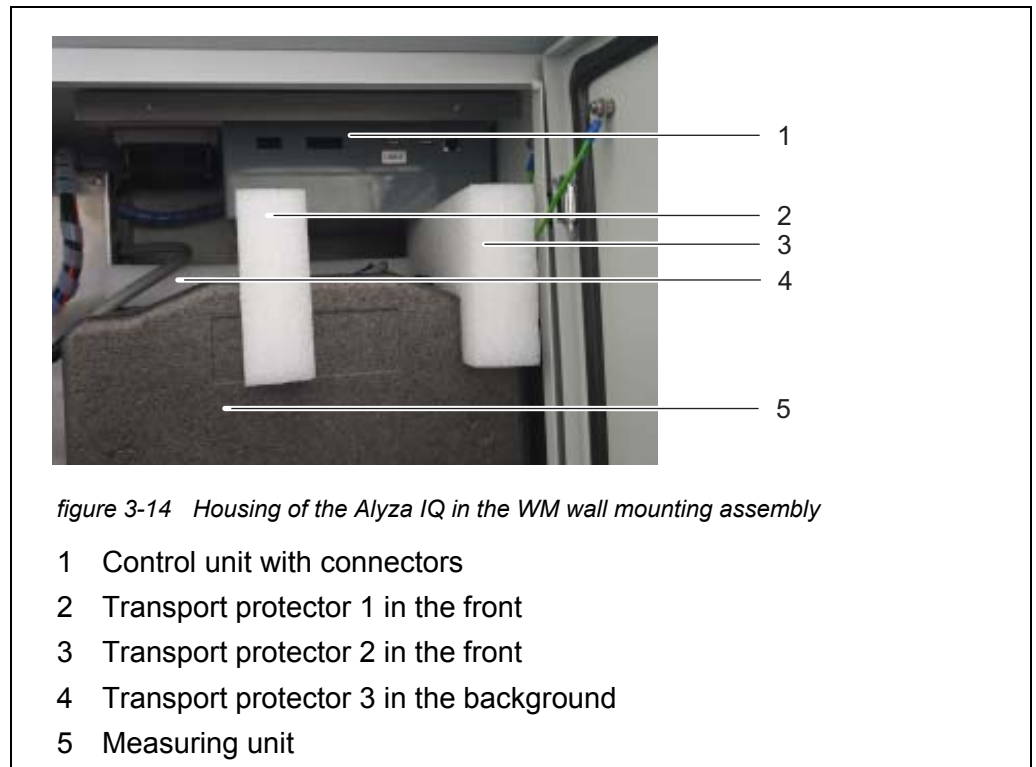


figure 3-14 Housing of the Alyza IQ in the WM wall mounting assembly

- 1 Control unit with connectors
- 2 Transport protector 1 in the front
- 3 Transport protector 2 in the front
- 4 Transport protector 3 in the background
- 5 Measuring unit

- 3 Pull the two transport protectors (2, 3) out to the front.
- 4 Carefully move the transport protector (4) of the measuring unit (5) upward and then pull it out to the front. The third transport protector is behind the transport protectors already removed.
- 5 Keep all transport protectors.
- 6 To transport the instrument, always use the transport protectors.

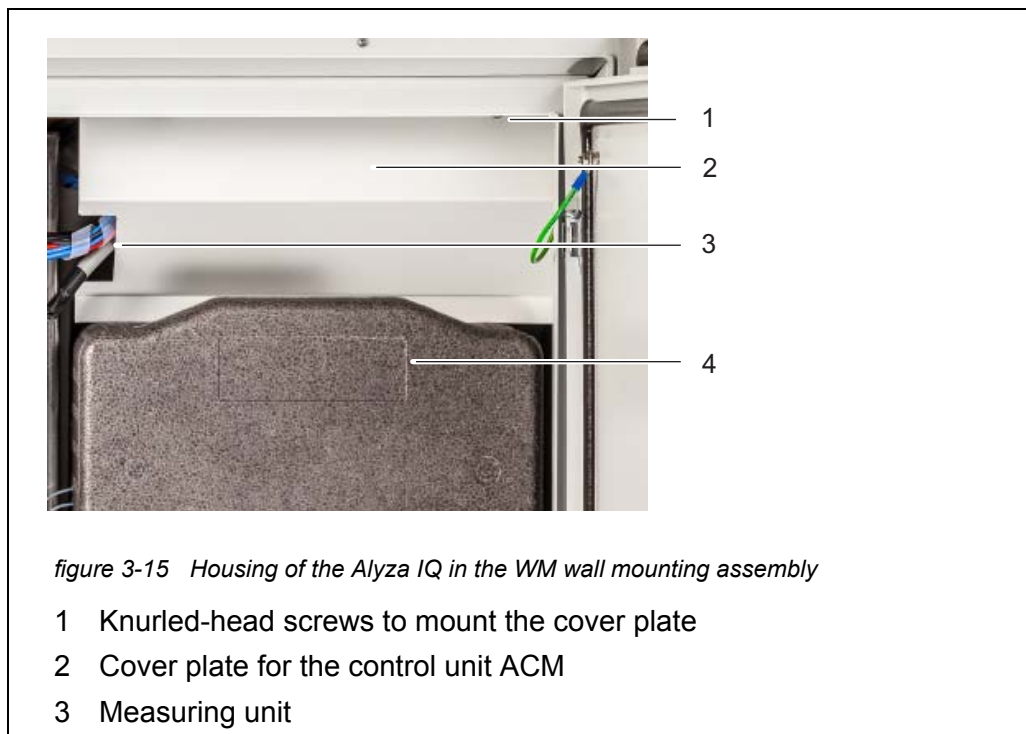
### 3.3.9 Connecting the cables to the control unit ACM

- 1 Remove the transport protection of the measuring unit (see chapter 3.3.8 Removing the transport protection of the measuring unit, [44](#)).  
4 cable ends to be connected to the control unit are on the measuring unit.
- 2 Connect the 4 cables to the sockets of the control unit ACM. Connect the USB cable to the unlabeled USB connector (the connector labeled "USB0" remains free).  
All other plugs will only fit into one socket in the correct direction.

### 3.3.10 Mounting the cover plate for the control unit ACM

The cover plate for the control unit ACM covers the control unit ACM and the cables connected to it.

- 1 Remove the transport protection of the measuring unit (see chapter 3.3.8 Removing the transport protection of the measuring unit, [44](#)).  
4 cable ends are on the measuring unit.
- 2 Connect the 4 cables lying on the measuring unit to the control unit (see chapter 3.3.9 Connecting the cables to the control unit ACM, [45](#)).
- 3 Unscrew the 2 knurled-head screws from the top hat rail on the housing top,
- 4 Screw the cover plate to the top hat rail with the 2 knurled-head screws.



### 3.3.11 Installing the bug screen and condensate drain adapter

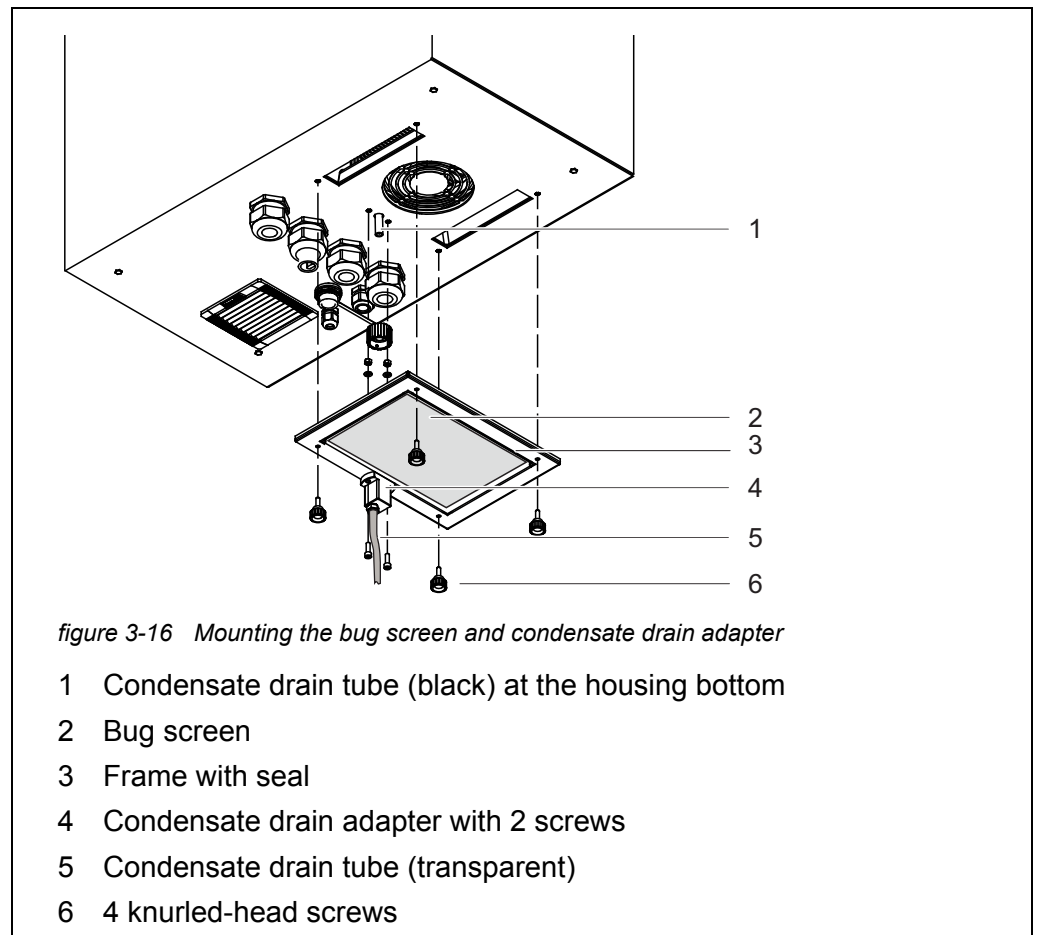
**Bug screen** The bug screen protects the interior of the Alyza IQ against insects coming in through the air intake opening in the bottom of the housing.

**Condensate drain** Operation of the Alyza IQ can, with the local temperature approx. 25 °C or higher and a high humidity, lead to the condensation of water within the cooling unit. The condensate drain adapter guides the condensate that has formed to the

outside.

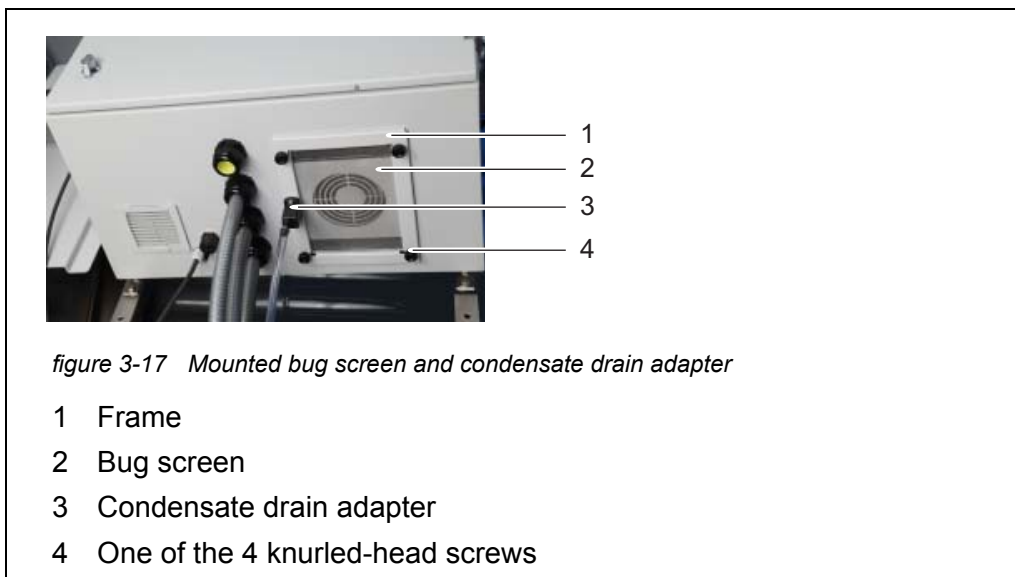
Some of the condensate will collect at the housing bottom and at the cooling unit. This condensation water occurring during operation does not adversely affect the functioning of the Alyza IQ.

The condensate drain tube of the Alyza IQ is in the recess of the condensate drain adapter. Any condensate forming will first fill the recess in the adapter before overflowing. When enough condensate is present, it closes the condensate drain tube so that no air moisture can penetrate the housing.



- Installation**
- 1 Screw the condensate drain adapter (4) with 2 screws to the frame (3) so that the tube nozzle of the adapter is on the outside edge of the frame.
  - 2 Plug the transparent condensate drain tube (5) onto the tube nozzle of the condensate drain adapter (4) as far as it will go.
  - 3 Insert the bug screen (2) in the frame so that it is kept in position by the seal of the frame (3).

- 4 Position the frame (3) with the bug screen (2) and the mounted condensate drain adapter (4) at the underside of the housing. When doing so, the black condensate drain tube (1) at the underside of the housing should exactly fit into the recess of the condensate drain adapter (4).
- 5 Screw the frame (4) to the housing bottom using the 4 knurled-head screws.



### 3.3.12 Mounting the terminal holder (TM)

Operating the Alyza IQ, especially while maintenance activities are being executed at the open measuring unit, requires a terminal mounted in the vicinity (e.g. DIQ/S 28x or MIQ/TC 2020 3G). The terminal should be mounted at the left-hand side of the Alyza IQ so that the terminal is always visible while maintenance activities are being executed at the open measuring unit.

The accessory Terminal holder (TM) enables to install a terminal, irrespective of the mounting of the Alyza IQ (mounting stand SM, rail RM, wall WM), in the vicinity of the Alyza IQ.



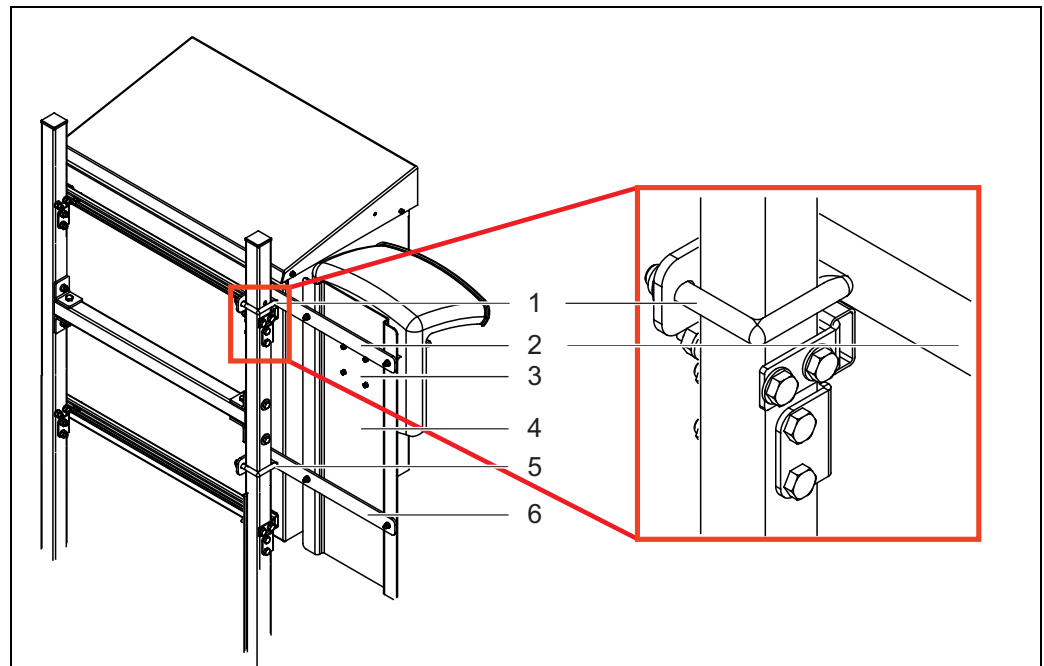


figure 3-18 Installed terminal holder TM (view of the rear side)  
Example: Installation on an SM stand mount

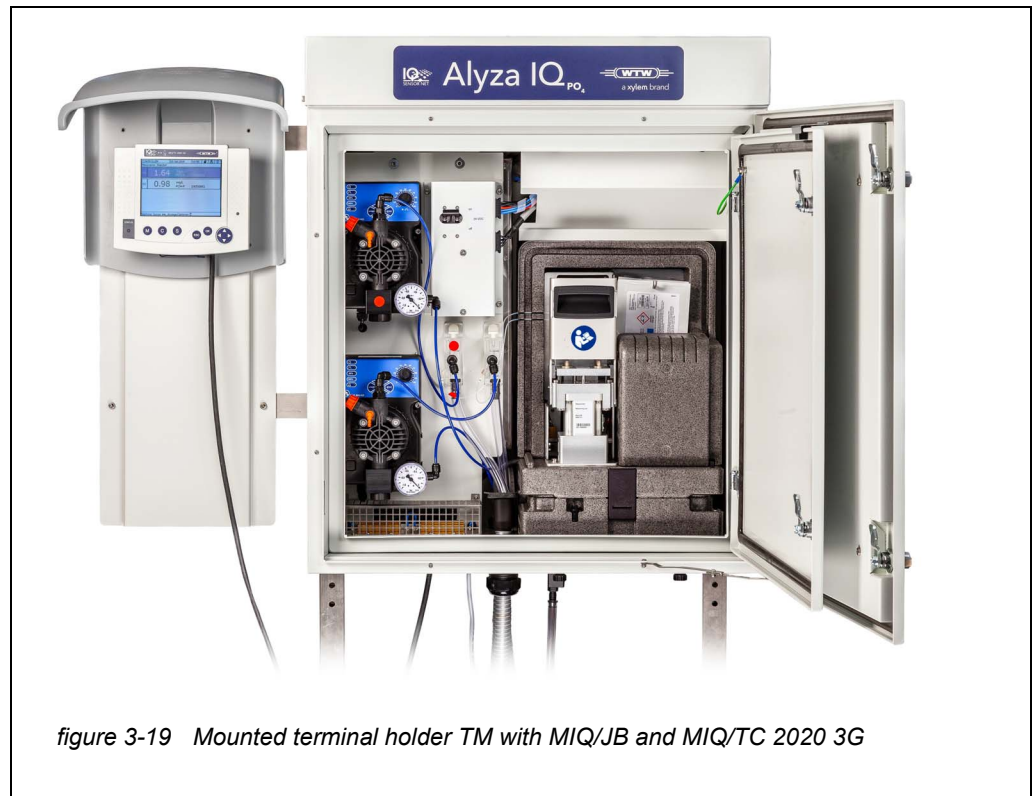
- 1 Upper bracket
- 2 Upper angle bracket
- 3 Bore holes for the canopy
- 4 Mounting sheet
- 5 Lower bracket
- 6 Lower angle bracket

### Mounting the terminal holder

The terminal holder is installed at the left-hand side of the mounting stand SM. Thus the terminal is always visible, even with maintenance activities being executed at the open housing of the Alyza IQ.

- 1 Position the mounting stand with the Alyza IQ mounted. The rear of the mounting stand has to be freely accessible.
- 2 Insert the long side of an angle bracket (2) between the housing and mounting stand, above the upper C-rail and past the mounting stand until the short side of the angle bracket touches the mounting stand. Keep the angle bracket in this position.
- 3 Position a bracket (1) on the mounting stand and insert the ends of the bracket in the bore holes of the angle bracket. Fix the angle bracket (2) to the bracket loosely with 2 nuts.

- 4 Insert the long side of the second angle bracket (6) between the housing and mounting stand, under the lower C-rail and past the mounting stand until the short side of the angle bracket touches the mounting stand. Keep the angle bracket in this position.
- 5 Position the second bracket (5) on the mounting stand and insert the ends of the bracket in the bore holes of the angle bracket. Fix the angle bracket (6) to the bracket loosely with 2 nuts.
- 6 Screw the mounting sheet (4) to both brackets (2, 6) with 4 hexagon socket screws and nuts.
- 7 Hold the mounting sheet (4) in the desired height and tighten the 4 nuts at the brackets (1, 3) until the terminal holder is safely mounted.
- 8 On the rear side of the mounting sheet (4), plug four screws into the drillings (3) far enough so that they can be seen on the other side.
- 9 Tighten the 4 screws to fix the canopy to the mounting sheet (4).
- 10 Mount an IQ module (e.g. MIQ/JB, DIQ/S 28x, ...) to the canopy (see system operating manual).
- 11 Dock a terminal onto the MIQ/JB as necessary.
- 12 Connect the IQ SENSORNET cable of the Alyza IQ to the IQ module (see system operating manual).
- 13 If necessary, connect the IQ module with a second IQ SENSORNET cable to integrate the Alyza IQ into an existing IQ SENSORNET (see system operating manual).



### 3.3.13 Mounting the collection funnel

Waste from the measuring unit and excess sample from the overflow vessels have to be transported out of the housing of the Alyza IQ.

The collection funnel collects the liquids from up to 3 sources (waste from the measuring unit, sample from overflow vessel 1 and overflow vessel 2 ) and transports them out of the housing via a common waste tube.

To keep moisture and damp air from penetrating the housing of the Alyza IQ, the collection funnel is closed with a rubber cap. Unused openings of the rubber cap are closed with blind plugs.

The collection funnel is installed in the housing of the Alyza IQ at the second cable gland from the front.



It is possible to dispose of the sample return and the waste from the measuring unit separately by using a second collection funnel (accessory WF Set). The second collection funnel is installed at the front cable gland. There the sample return is transported out of the housing separately.

**Scope of delivery  
of the collection  
funnel of the  
Alyza IQ**

- Collection funnel
- Rubber cap for collection funnel
- 3 plugs for the 3 tube openings of the rubber cap
- 2 sample return tubes
- Cable ties to fasten the collection funnel to the fixing bracket.

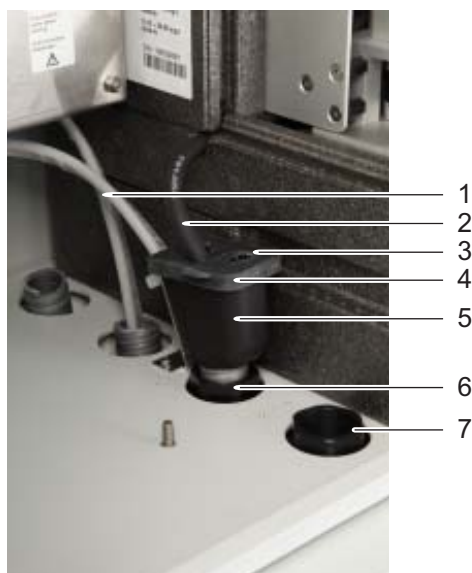
**Preparatory  
activities**

When operating heat tracing lines for the outlet tubing:  
Install the heat tracing first (see chapter section 3.3.16 CONNECTING THE POWER CABLE, HEAT TRACING LINES, AND TUBES).




Install the collection funnel together with the heat tracing lines. If the mounting plate is removed, there is more room to install the collection funnel.


**Mounting**



*figure 3-20 Collection funnel for the common discharging of all liquids*

- 1 Heating line of the heat tracing  
(attached to the fixing bracket with a cable tie)
- 2 Opening for a sample return tube from an overflow vessel
- 3 Waste line of the measuring unit
- 4 Rubber cover of the collection funnel
- 5 Collection funnel
- 6 Cable gland (2nd from the front)
- 7 Cable gland (in the front)

- 1 Insert the waste tube into the housing from the outside through the cable gland (6). Inside, the end of the waste tube should be flush with the cable gland (6).  
Details on the how to install the outlet tubes and heat tracing lines: see chapter 3.3.16 Connecting the power cable, heat tracing lines, and tubes,  56
- 2 Fix the heating line (1) of the waste tube to the fixing bracket behind the cable gland with the cable tie (scope of delivery: WF Set).
- 3 Insert the collection funnel (5) into the opening of the cable gland (6) inside the housing. The slanted side of the collection funnel (5) should point to the heating line (1).
- 4 Pull the rubber cover (4) of the collection funnel over the edges of the collection funnel.  
The opening of the collection funnel should be closed tightly.
- 5 Put the waste line (3) of the measuring unit into the collection funnel through the small opening of the rubber cover (4).  
The liquid in the waste line must be able to flow freely (steady slope, no kinking, no damage).
- 6 If all liquids are disposed of through a joint outlet:  
Put the sample return tubes (2) of the overflow vessels into the collection funnel through the big openings of the rubber cover (4).
- 7 Close any unused openings of the rubber cover (4) with the plugs provided so that the housing interior is protected against humidity.

If the liquids are disposed of via a second collection funnel available as an accessory (WF Set): see section 3.3.14 Mounting the WF Set (collection funnel for sample return),  53.

### 3.3.14 Mounting the WF Set (collection funnel for sample return)

To transport from the housing the waste from the measuring unit separately from the sample return, install a second collection funnel (accessory, WF Set). Via the second collection funnel, only the sample return is transported out of the housing. To collect and dispose of the waste from the measuring unit, a suitable (chemical resistant, winterproof) collecting container is required additionally.

#### Scope of delivery of the WF Set

- Collection funnel
- Rubber cap for collection funnel
- 3 plugs for the 3 tube openings of the rubber cap
- Transparent sample return tube
- Fixing angle bracket for the heating line at the foremost cable gland with cheese-head screws (M3x8)

- Cable ties to fasten the collection funnel to the fixing bracket

### Mounting

- 1 Insert the sleeve tube of the second waste line into the housing from the outside through the cable gland (7). Inside, the end of the waste tube should be flush with the cable gland (7).  
Details on the how to install the sleeve tubes and heat tracing lines: see chapter 3.3.16 Connecting the power cable, heat tracing lines, and tubes, 56
- 2 Install the sleeve tube of the second waste tube in the interior of the housing so that it is flush with the cable gland (7).
- 3 Pull off the short sample return tubes from the overflow vessels.
- 4 Cut off pieces of the transparent sample return tube included in the scope of delivery long enough that the new sample return tubes go from the overflow vessels to the foremost collection funnel.
- 5 Plug the sample return tubes newly cut from the WF Set onto the overflow vessels.
- 6 Insert the collection funnel into the opening of the cable gland (7) inside the housing. The slanted side of the collection funnel should point to the heating line.
- 7 Pull the rubber cover (4) of the collection funnel over the edges of the collection funnel.  
The opening of the collection funnel should be closed tightly.
- 8 Put the sample return tubes of the overflow vessels into the collection funnel through the big openings of the rubber cover.
- 9 Close any unused openings of the rubber cover with the plugs provided so that the housing is protected from humidity.
- 10 Position a suitable collecting container (chemical resistant, winterproof) under the Alyza IQ to collect the waste from the measuring unit.
- 11 Plug the waste tube of the cable gland (6) into the collecting container for waste from the measuring unit.

### 3.3.15 Installing the FM/PC filter module and M 1.5 basin holder for filtration

#### Installation instructions

Heed the following notes when installing the filter module:

- Mount the filter module so that the plate is in a position vertical to the flow direction.

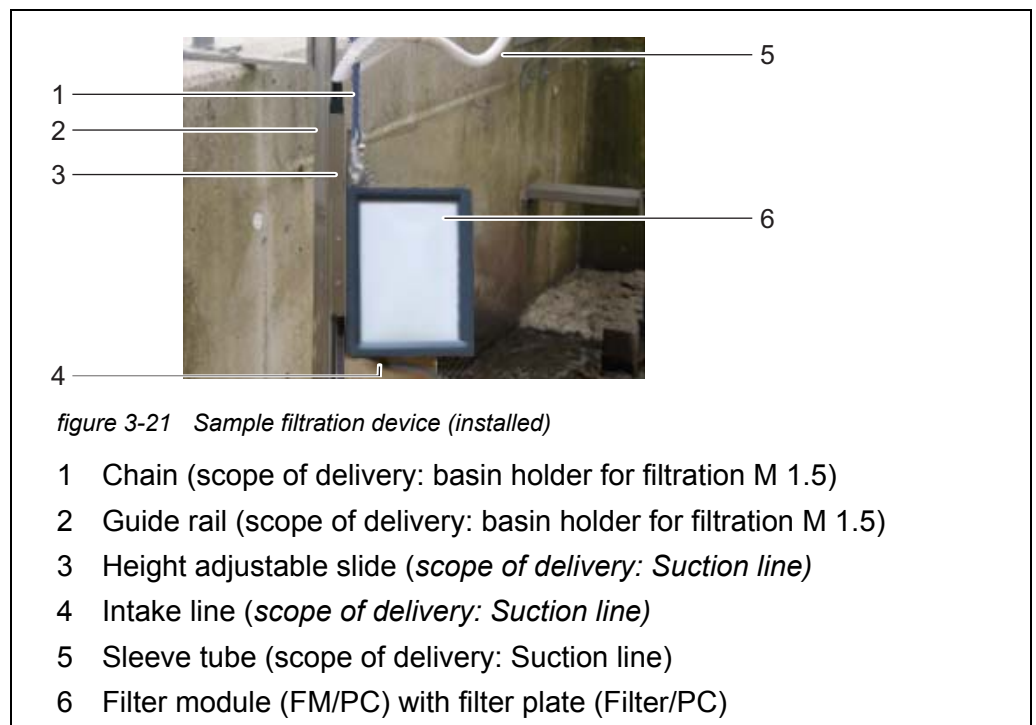


In special cases (e.g. in a channel) it is better to mount the FM/PC filter module in a horizontal position in the flow direction. An adapter for horizontal mounting is available as an accessory.

- The filter module (FM/PC) and the slide must be completely submersed (max. 40 cm).  
Take changing water levels into account when mounting the filter membrane module.
- The lower edge of the filter module must be mounted with at least 10 cm distance to the bottom.

### Installation

- 1 Mount the rail of the basin holder for filtration in the basin.  
If necessary, extend the rail with the M-EXT 1.5 extension accessory.



- 2 Mount the filter module on the slide of the basin holder for filtration.
- 3 Connect the intake line to the filter module.
- 4 Insert the slide of the filter module in the rail and lower it into the basin with the aid of the chain. Fix the end of the chain outside the basin.
- 5 Run the intake line to the Alyza IQ. Fix the sleeve tube with cable ties at some suitable places as necessary. How to connect the intake line to the Alyza IQ, see section 3.3.17, 64.

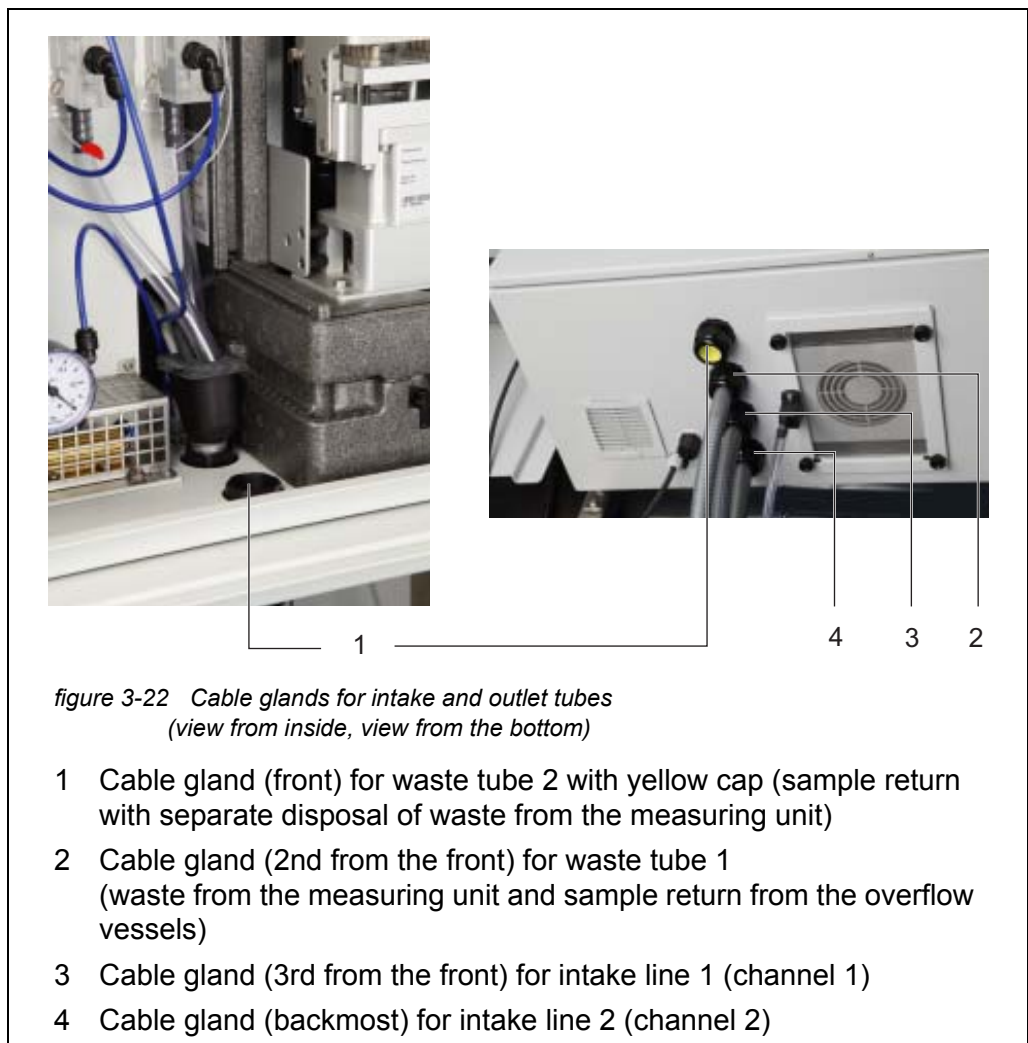
### 3.3.16 Connecting the power cable, heat tracing lines, and tubes



For all work done with the housing open:

- If the Alyza IQ was already in operation:  
Before opening the measuring unit, start the maintenance routine at the terminal.
- Note the environmental conditions (see section 3.3.1 Requirements of the measurement location, 28).
- Open the outer housing door far enough so the arrestable brake-stay (on the lower right side of the housing) catches.
- Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.

All tubes are inserted into the housing through dust-proof lead-in ducts. The cable glands with seals are at the bottom of the housing.





Opening the power  
box  
(to connect the  
heat tracing)

**WARNING**

If the power supply is connected incorrectly, there may be danger to life from electric shock.

Pay attention to the following points during installation:

- The power supply box may only be connected to the power supply by a qualified electrician.
- The power supply box may only be connected to the power supply when it is not carrying any voltage.
- The power supply must fulfill the specifications given on the nameplate and in chapter 7 Technical data, [137](#).
- The power supply of the heat tracing must fulfill the specifications given on the heat tracing (240 VAC or 120 VAC).
- To operate a heat tracing line, a fault current protection switch (ground fault circuit interrupter) has to be installed.
- The power cable must meet the requirements according to the technical data (see section 7.4 Electrical data, [142](#)).

In the delivery condition, the power cable (2 m length) is connected to the terminals in the power supply box of the Alyza IQ and is run outside through the housing bottom of the Alyza IQ.

The power cable is delivered without plug. It is designed to be directly connected to the power supply.



If necessary, you can install a longer power cable in the power supply box (see section 3.3.16 Connecting the power cable, heat tracing lines, and tubes, [56](#)). When doing so, note the requirements of the power cable (see section 7.4 Electrical data, [142](#)).

We recommend installing an additional external power interrupter to be able to switch the power supply box potential free from outside.

If a heat tracing is connected, a fault current protection switch (ground fault circuit interrupter) and a fuse must be installed additionally.

To connect to the power supply box a heat tracing or power cable, the mounting plate has to be removed.

- 1 Switch the power line potential free.
- 2 Open the outer housing door far enough so the arrestable brake-stay (on the lower right side of the housing) catches.

- 3 Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.
- 4 Unscrew the 2 fixing nuts of the cover (on the top right side in the housing) and remove the cover of the control unit ACM.



If the filtration pumps have already been in operation, sample liquid may escape when the tubes are unscrewed. Provide a collecting container in such a case.

- 5 Remove the cable connections and lines of the mounting plate:
  - Unplug the 2 cables from the switch box.
  - Unscrew the lines from the overflow vessels to the measuring unit.
  - Unplug the blue intake lines of the filtration unit.
- 6 Remove the mounting plate:
  - Unscrew the 2 fixing nuts (3) at the bottom of the mounting plate.
  - Unscrew the 2 fixing screws (2) at the upper edge of the mounting plate.Secure the mounting plate against falling out.

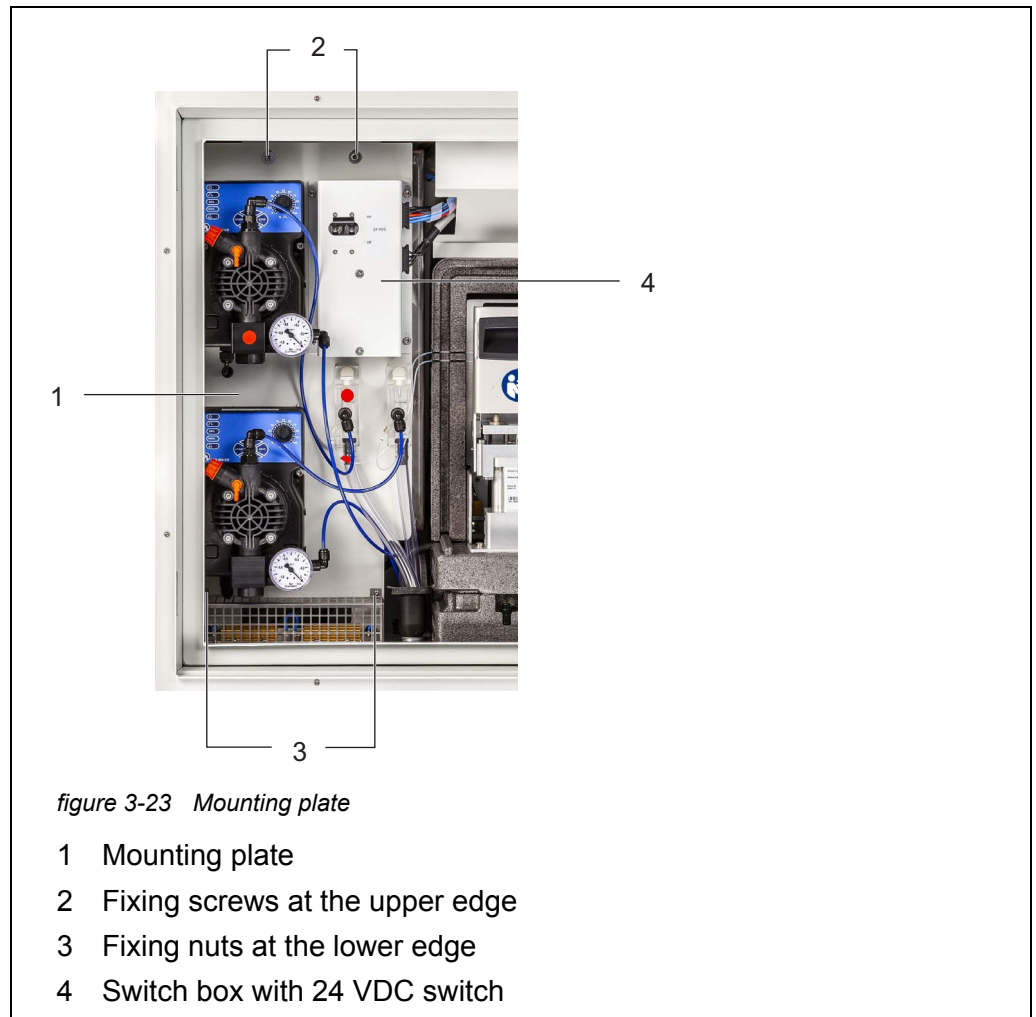
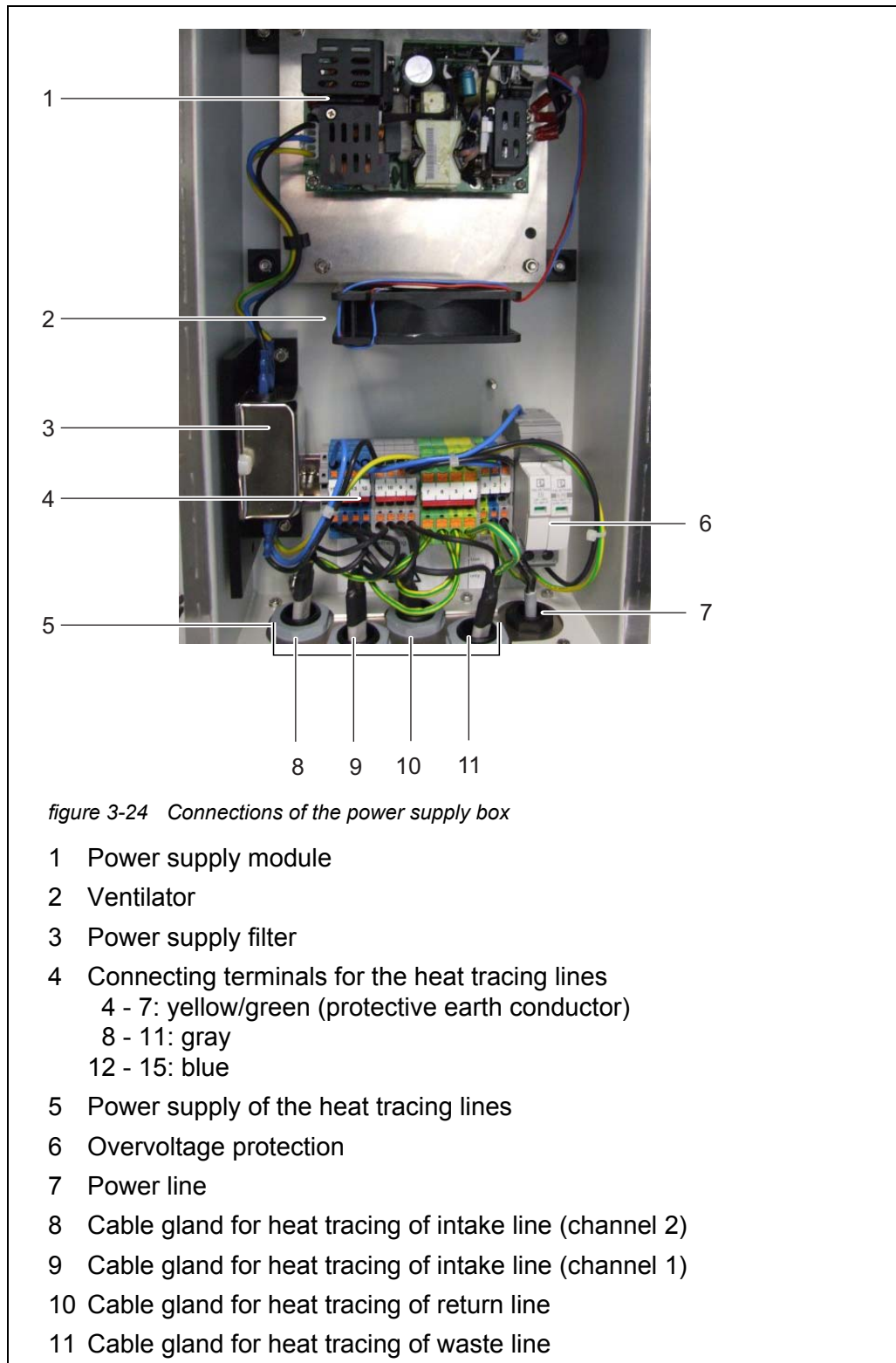


figure 3-23 Mounting plate

- 1 Mounting plate
  - 2 Fixing screws at the upper edge
  - 3 Fixing nuts at the lower edge
  - 4 Switch box with 24 VDC switch
- 
- 7 Remove the mounting plate:
    - Lift the mounting plate upward over the threaded pins.
    - Tilt the upper edge of the mounting plate somewhat backwards and remove the mounting plate from the housing downwards.
    - Place the mounting plate with the rear side down on a protected surface (e.g. with cardboard).
  - 8 Unscrew all nuts with safety disks (10 pieces) from the power supply box and remove the lid of the power supply box.



- 9 Unscrew the nuts of the cable glands for the cables of the heat tracing at the underside of the power supply box.

**Connecting the intake lines and return lines (accessories)**

- 10 Remove the protective plugs from the cable glands on the underside of the power supply box.
- 11 Only for variants with 2 sample channels:  
Run the intake line for channel 2 through the big rear cable gland (from the rear housing panel) at the housing bottom.
  - The sleeve tube should end flush with the tube inside the housing so that a funnel can be installed.
  - Fix the sleeve tube with the cable gland.
- 12 Run the intake line for channel 1 through the second big cable gland (from the rear housing panel) at the housing bottom.
  - The sleeve tube should end flush with the tube inside the housing so that a funnel can be installed.
  - Fix the sleeve tube with the cable gland.
- 13 Run the return line through the next big cable gland at the housing bottom.
  - The sleeve tube should end flush with the tube inside the housing so that a funnel can be installed.
  - Fix the sleeve tube with the cable gland.



The sample in the sample return line must be able to flow freely (steady slope). Do not immerse the end of the return line in water.

- 14 To collect the chemical waste of the photometer unit separately, it is required to install the collection funnel (WF Set):
- 15 Run the waste tube for chemical waste through the front big cable gland at the housing bottom.
  - The sleeve tube should end flush with the tube inside the housing so that a funnel can be installed.
  - Fix the sleeve tube with the cable gland.
  - Position a suitable collecting container for chemical waste under the Alyza IQ and secure it.
  - Put the waste tube into the collecting container and secure it.
  - The photometer waste in the drain line must be able to flow freely (steady slope). Do not immerse the end of the waste line in water.

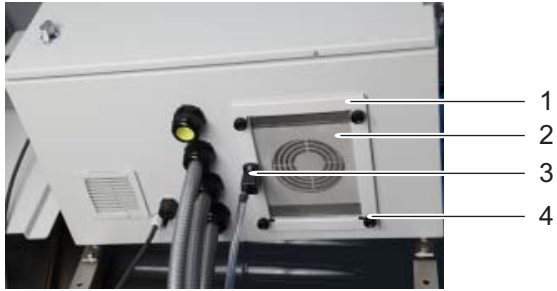


figure 3-25 Connections at the housing bottom (from below)

- 1 Frame
- 2 Bug screen
- 3 Condensate drain adapter
- 4 One of the 4 knurled-head screws

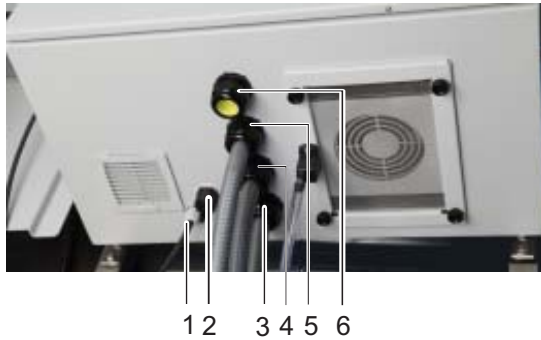


figure 3-26 Connections at the housing bottom (from below)  
Example: 2 sample channels, 1 drain

- 1 IQ SENSORNET cable
- 2 Power line
- 3 Variants with 2 sample channels:  
Gland for sleeve tube of intake line for channel 2
- 4 Gland for sleeve tube of intake line for channel 1
- 5 Gland for sleeve tube of the return line
- 6 Screw couplings for sleeve tube of the waste line,  
unused and closed with a blind plug (yellow)



Unused cable glands have to be closed with the supplied plugs.

**Connecting the cable with the power supply box**

**NOTE**

No other consumers, with the exception of those described in this operating manual, may be connected to the mains box.

*Line branches in the supply lines are not permitted.*

- 16 Slide the nut of the cable gland (of the power supply box) over the cable of the heat tracing.
- 17 First run the wire with the greatest diameter (protective earth conductor, yellow/green) through the sealing of the cable gland.
- 18 Then run the two thinner wires (black) of the heat tracing through the sealing of the cable gland.
- 19 Push the entire cable with the cable sheath through the sealing until the cable is visible in the power supply box.
- 20 Insert the cables of the heat tracing for the intake lines, the return line and the waste line through the cable glands on the underside.
- 21 Screw tight the nut of the cable gland (with a torque of 7.5 Nm).
- 22 Insert all heat tracing cables into the power supply box.
- 23 Insert the heat tracing wires into the respective terminals so that each terminal catches.  
Green/yellow cable: any green/yellow terminal  
1st black cable: any blue terminal  
2nd black cable: any gray terminal




The heating bands of the heat tracing must start within the housing of the Alyza IQ to keep the lines frost free. At the outlet of the return line, the heat tracing must protrude 20 to 50 mm from the sleeve tube. If necessary, shift the heat tracing in the sleeve tube accordingly.

- 24 If necessary, replace the power cable with another power cable (e.g. a longer one).
- 25 Check whether all connections are made correctly.
- 26 Tighten the cable glands on the power supply box with a torque of von 2.5 Nm.  
The cable glands protect the power supply box from dust and moisture.



Make sure that no cable touches the power supply filter.

- 27 Remount the lid of the power supply box and screw tight all nuts with safety disks as far as they will go (0.4 Nm).  
The power supply box is closed and protected against dust and moisture.

- 28 Insert the mounting plate:
  - Plug the mounting plate on the threaded pins inside the housing.
  - Tighten the 2 fixing screws (2) at the upper edge of the mounting plate.
  - Tighten the 2 fixing nuts (3) at the bottom of the mounting plate.
- 29 Reinsert the cover and fix it with the 2 fixing nuts.
- 30 Establish the cable connections and liquid lines.
  - Connect the 2 cables to the switch box.
  - Plug the intake lines onto the connectors of the filtration pumps.
  - Screw the sample tubes to the measuring unit onto the connectors of the overflow vessels.
  - Connect the liquid lines (see section 3.3.17 Connecting the liquid tubes,  64).
  - Mount the funnel for the return line(s) and, if necessary, a second funnel for the waste line.
  - Mount the return line(s) in the funnel and, if necessary, the waste line in a second funnel.

### 3.3.17 Connecting the liquid tubes

In the delivery condition, all liquid lines within the Alyza IQ are connected. After connecting the intake lines to the housing, connect the blue intake lines to the filtration pumps and the return lines from the overflow vessels and the waste line of the measuring unit to the return line or the waste line.



For all work done with the housing open:



- If the Alyza IQ was already in operation:
  - Before opening the doors, start the maintenance routine at the terminal.
- Note the environmental conditions (see Abb. 3.3.1,  28).
- Open the outer housing door far enough so the arrestable brake-stay catches.
- Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.

Abb. 3-27,  65 shows the housing with the completely connected lines including the accessories and all options:



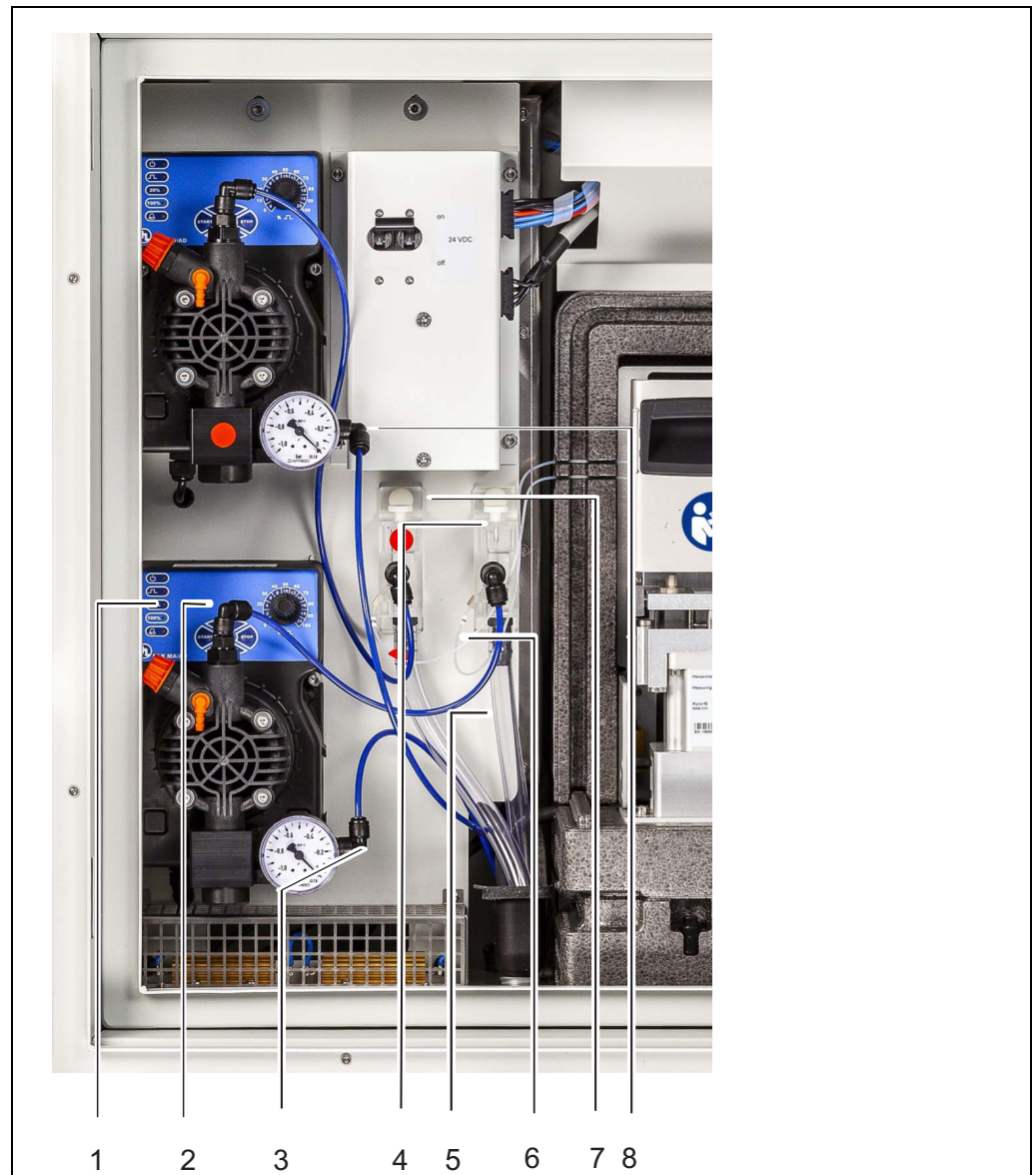


figure 3-27 Completely connected lines

- 1 Channel 1: Filtration pump 1
  - 2 Channel 1: Sample feed line (filtration pump 1 - overflow vessel 1)
  - 3 Channel 1: Intake line (filtration pump 1)
  - 4 Channel 1: Overflow vessel 1
  - 5 Channel 1: Return line (sample return from overflow vessel 1)
  - 6 Channel 1: Sample tube (overflow vessel - measuring unit)
  - 7 Channel 2: Overflow vessel 2
  - 8 Channel 2: Intake line (filtration pump 2)
- All parts for channel 1 described here are also available for channel 2

Proceed as follows to connect each line:

- 1 Connect the intake line 1 to the filtration pump 1.
- 2 Connect the intake line 2 to the filtration pump 2.
- 3 Install the funnels for the return line and, if necessary, for the waste line.
- 4 Insert the waste tube from the photometer unit into the funnel for the waste line.
- 5 Insert the return tubes of the overflow vessels into the funnel for the return line.



The sample return must be able to drain off freely (downward slope). Do not immerse the end of the hose in water.

- 6 If necessary, insert the drain line (6) of the photometer unit into the sleeve tube of the waste line.

### 3.3.18 Setting up a connection with the IQ SENSORNET system

In the delivery condition the IQ SENSORNET cable (2 m long) is connected to the ACM control unit of the Alyza IQ and is run to the outside through the bottom plate.

Connect the IQ SENSORNET cable of the Alyza IQ to an IQ SENSORNET module mounted in the vicinity.



For detailed information on how to connect the IQ SENSORNET cable to an IQ SENSORNET module mounted in the vicinity please refer to the IQ SENSORNET system operating manual, paragraph "Distributed mounting".

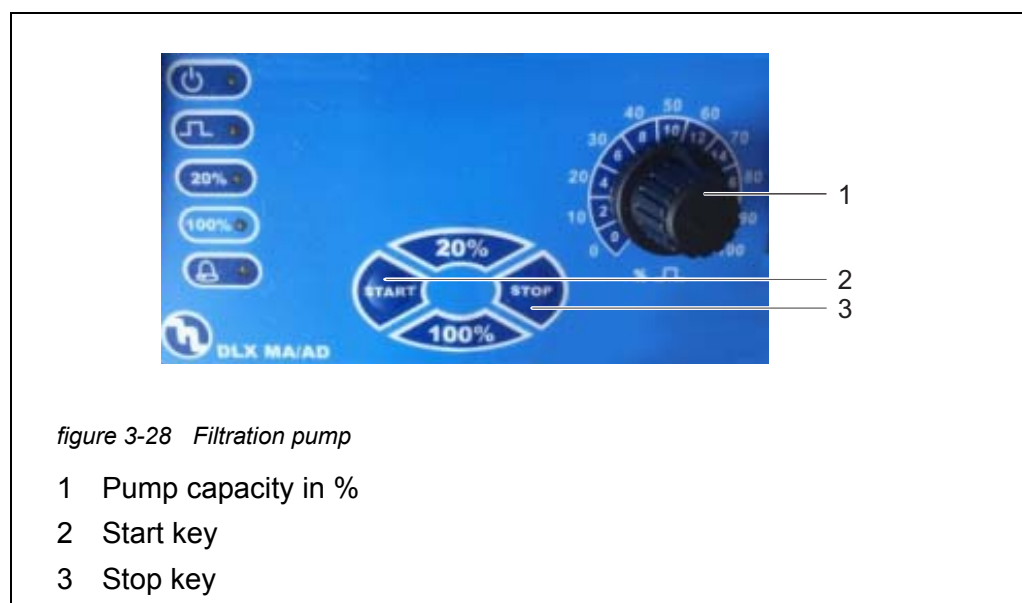
If the Alyza IQ is operated in an IQ SENSORNET configured minimally, we recommend that you set the terminator switch in the MIQ module (e.g. MIQ/JB) to ON (see IQ SENSORNET system operating manual).

Example of a simple IQ SENSORNET system:

- 1 TerminalController ( e.g. MIQ/TC 2020 3G),
- 1 MIQ module (e.g. MIQ/JB),
- 1 sensor (e.g. Alyza IQ)

### 3.3.19 Taking the filtration pumps into operation

- 1 Make sure that all lines (intake lines, return line, waste line) and the sample feed tube are correctly connected in the Alyza IQ.
- 2 Set the 24 VDC switch on the mounting plate to ON (I pressed upward).
- 3 Use the rotary knob to set the pump capacity to 80 ... 100 %.



- 4 Switch on the filtration pump with the Start key.
- 5 Wait until sample liquid runs from the overflow vessel into the return line. Depending on the length of the intake line, this may take some minutes.



If no sample runs into the overflow vessel, proceed in one of the following ways.

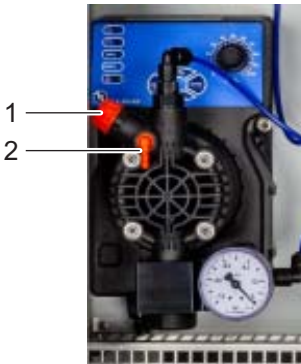


figure 3-29 Filtration pump

- 1 Vent valve
- 2 Vent connection

- Open and then close again the ventilation valve (1).
- Fill the intake line with water manually:
  - Switch off the filtration pump.
  - Pull the intake line off the filtration pump.
  - Fill the intake line with water (e.g. using a wash bottle).
  - Connect the intake line to the pump again and secure it.
  - Switch the filtration pump on again.
- Increase the suction power manually:
  - At the vent connection (2), connect a syringe with a tube:
  - Open the vent valve (1).
  - Create an additional negative pressure with the syringe.
  - Close the vent valve (1).
  - Repeat the procedure until sample runs into the overflow vessel.
  - Remove the tube and syringe from the vent connection (2).

- 6 As soon as a sufficient amount of sample is flowing, reduce the pump capacity to 5 - 10 % with the rotary knob.



Adjust the pump capacity so that the superfluous amount of sample can run off into the return tube via the drain.  
No sample may come into the housing through the vent valve.

- 7 For the Alyza IQ variant with 2 sample channels:  
Take the second filtration pump into operation.
- 8 Let the sample feed run continuously, until the sample flow is stable and no more air is in the lines.
- 9 Close the doors of the housing.
- 10 If necessary, commission the IQ SENSORNET system (see the relevant IQ SENSORNET system operating manual).

### 3.4 Initial commissioning



For all work done with the housing open:

- If the Alyza IQ was already in operation:  
Before opening the measuring unit, start the maintenance routine at the terminal.
- Note the environmental conditions (see Abb. 3.3.1, 28).
- Open the outer housing door far enough so the arrestable brake-stay catches.
- Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.

For initial commissioning, proceed as follows:

- 1 Check all connections and tubes connecting the Alyza IQ with the outside world (see section 3.4.1 Checklist for commissioning, 69)
- 2 Install the replacement parts required in the Alyza IQ with the aid of the install wizard (section 3.4.2 Carrying out the install wizard, 70).
- 3 Complete the initial commissioning at the terminal of the IQ SENSORNET (see section 3.4.3 Preparing the Alyza IQ for measuring, 73)
- 4 In an IQ SENSORNET system without automatic air pressure compensation:  
Set the local altitude at the IQ SENSORNET in the menu **<S> / Settings / System settings / Location altitude/air pressure** (see IQ SENSORNET system operating manual).

#### 3.4.1 Checklist for commissioning

With the aid of the following questions, check whether the Alyza IQ is ready to start operating:

- Is the housing of the Alyza IQ installed safely  
(see section 3.3.4 Installing the housing, 31) ?
- Are all tubes for inlet and outlet of the sample installed  
(intake lines, return line, waste line as necessary,  
see section 3.3.16 Connecting the power cable, heat tracing lines, and tubes,  
56) ?
- Are the heat tracing lines installed to protect the intake and outlet lines  
against frost (see section 3.3.16 Connecting the power cable, heat tracing  
lines, and tubes, 56) ?
- Is the Alyza IQ safely connected to the power supply?  
Is there an external power disconnecter?

- Are the filtration pumps ready for operation and is the pump capacity adjusted (see section 3.3.19 Taking the filtration pumps into operation, 67) ?
- Is sample present in the overflow vessels?
- Is the Alyza IQ connected to the IQ SENSORNET (MIQ/JB + Terminal/Controller, is the Alyza IQ displayed as a sensor on the IQ SENSORNET terminal, see section 3.3.18 Setting up a connection with the IQ SENSORNET system, 66) ?
- Was the correct altitude or correct air pressure entered in the IQ SENSORNET system (menu <S> / *Settings* / *System settings* / *Location altitude/air pressure*, see IQ SENSORNET system operating manual) ?

### 3.4.2 Carrying out the install wizard

When all requirements for the commissioning are met, start the install wizard to install the replacement parts required.



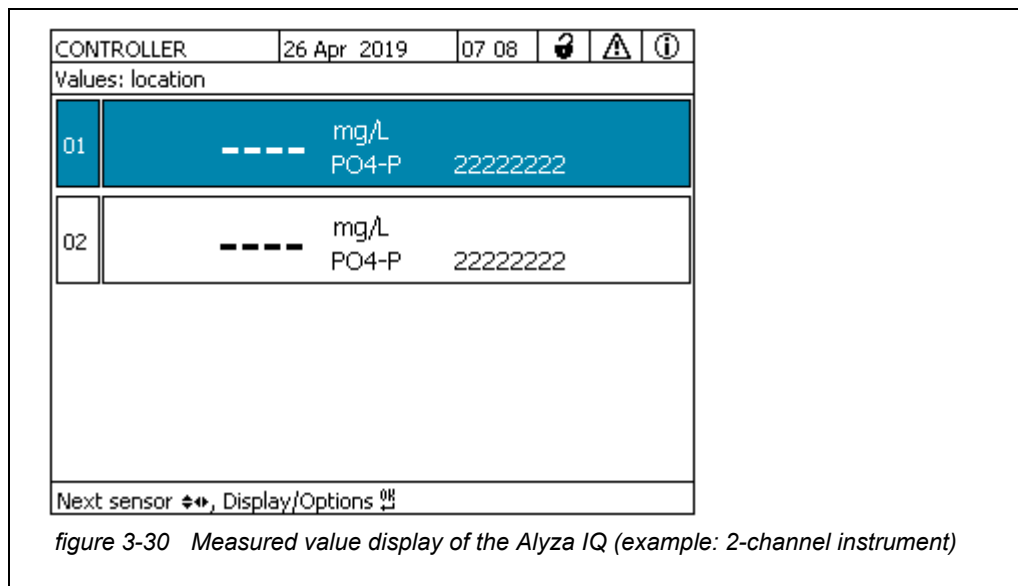
For the commissioning with the install wizard you have to know how to:

- Open the measuring unit,
- Install the MultiPort valve (MPV),
- Connect the ChemBags,
- Connect the tube to the MultiPort valve MPV
- Close the measuring unit.

The install wizard helps you carry out the commissioning steps in the correct order. Details on the individual steps are given in this operating manual.

Keep this operating manual ready at the installation location.

As soon as the controller of the IQ SENSORNET identifies the Alyza IQ, bars are displayed for the Alyza IQ in the measured value display of the IQ SENSORNET.



- 1 Highlight the measured value display of the Alyza IQ.
- 2 Open the Alyza menu with **<C>**.  
On initial commissioning, the install wizard of the Alyza IQ opens automatically.



For the commissioning you have to know how to:



- Open the measuring unit,
- Install the MultiPort valve (MPV),
- Install the ChemBag,
- Install the tube at the MultiPort valve (MPV)  
(if the functions *Backgr. corr.(opt)* or *2-point calibration* are configured)
- Close the measuring unit.

Details on the individual steps are given in the present operating manual of your Alyza IQ.

You can cancel and later continue the install wizard at any time. When the Alyza menu is opened, the install wizard starts automatically until a first valid configuration of the Alyza IQ is available. The install wizard does no longer automatically start once the parts required have been installed.

**WARNING****Dangerous chemicals.****Improper use of chemicals can cause damage to your health.****Heed the following rules:**


- **Read the labels of the chemicals containers and follow the safety instructions**
- **Wear protective equipment (lab coat, protective goggles, chemical resistant protective gloves, safety shoes)**

- 3 Put on your personal protective equipment (PPE) and chemical resistant gloves (see section 2.4 Personal protective equipment (PPE),  26).
- 4 Open the outer housing door far enough so the arrestable brake-stay (on the lower right side of the housing) catches.
- 5 Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.
- 6 Remove the front cover of the measuring unit.  
The measuring unit is ready to be opened when the LED of the measuring unit lights up white.
- 7 Using one hand, grip the handle at the upper edge of the front cover of the measuring unit.
- 8 Pull the front cover of the measuring unit somewhat to the front against the resistance.
- 9 Carefully lift the loosened part of the front cover out to the front.
- 10 Start the install wizard.
- 11 Follow the instructions of the install wizard.
  - Step 1:  
Configure all settings requiring the installation of replacement parts (ChemBags, tubes). From them, the install wizard makes a list of the replacement parts required.
  - Step 2:  
Install the replacement parts required (MultiPort valve, tube, ChemBags).  
Details on installing the replacement parts (see section 5.5,  104).



For the functions 2 point calibration and background correction (optimized), the installation of an additional tube is required in each case.



- 12 Re-insert the front cover of the measuring unit.
- 13 Close the housing of the Alyza IQ.
- 14 Prepare the Alyza IQ for measuring (see section 3.4.3,  73)

### 3.4.3 Preparing the Alyza IQ for measuring

After completing the install wizard, carry out some further steps at the terminal of the IQ SENSORNET.

- 1 Open the Alyza menu / tab *Maintenance / Maintenance functions of measuring unit*.
- 2 Carry out the function *Prepare measuring* (Alyza menu / tab *Maintenance / Maintenance functions of measuring unit / Prepare measuring*).
- 3 Switch to the menu *Maintenance / Manual functions*.

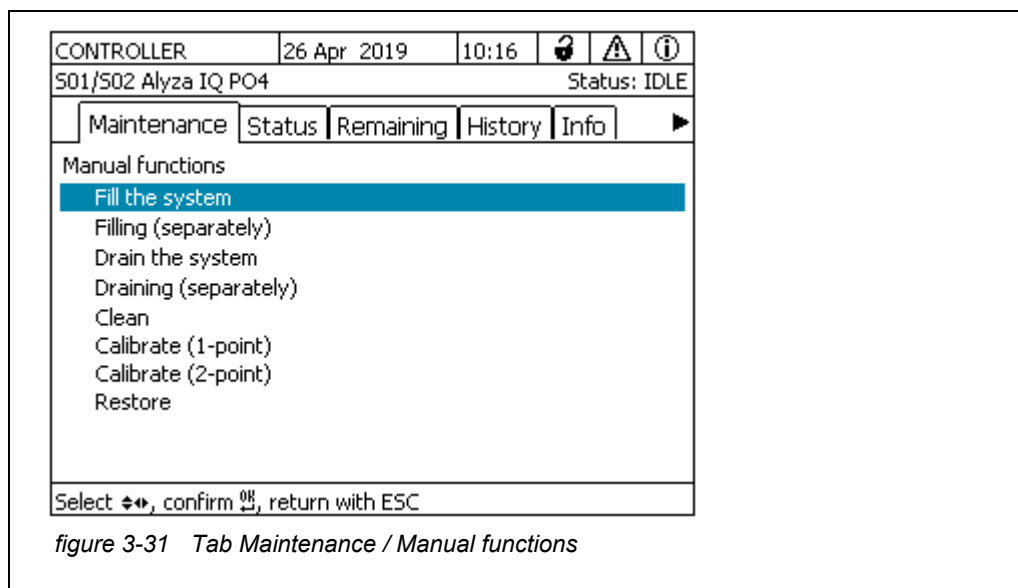
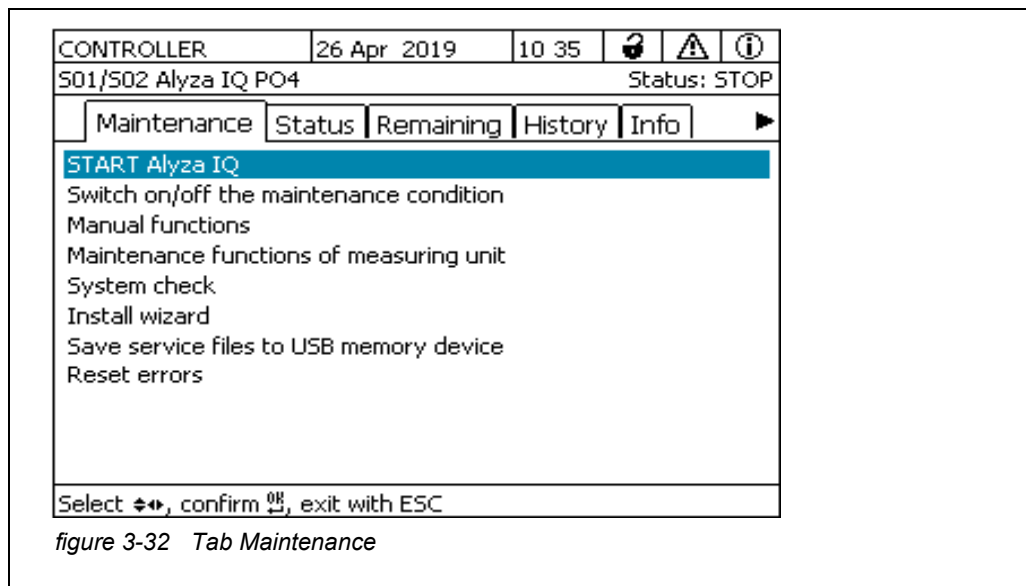


figure 3-31 Tab Maintenance / Manual functions

- 4 Carry out the function *Fill the system*. (Alyza menu / tab *Maintenance / Manual functions / Fill the system*). The tubes and MultiPort valve (MPV) are filled.
- 5 Quit the menu *Manual functions* with **<ESC>**.



- 6 Carry out the function *START Alyza IQ*.  
Measurement is started and the measured value is displayed in the measured value display after approx. 5 ... 7 minutes.  
Wait for the temperature adjustment to be completed.
- 7 If necessary, switch off the maintenance condition.  
(Alyza menu / tab *Maintenance* / *Switch on/off the maintenance condition*).
- 8 Check the settings for measurement  
(IQ SENSORNET measured value display / <S> / Settings of sensors and difference sensors)

## 4 Measurement / Operation

### 4.1 General operating principles

Contrary to the general operating principles of the IQ SENSORNET, the Alyza IQ is operated via a separate menu (Alyza menu) at the IQ SENSORNET terminal.

#### Opening the Alyza menu

- 1 In the measured value display, use <▲▼> to select the Alyza IQ.
- 2 Using the <C> key, switch to the Alyza menu.  
The Alyza menu opens with the tab *Status*.  
The tab *Status* provides information on the current operating status of the Alyza IQ.

The screenshot shows the Alyza menu interface. At the top, it displays 'CONTROLLER', the date '07 May 2019', and time '08 13'. Below this, it shows 'S01/S02 Alyza IQ PO4' and 'Status: IDLE'. A menu bar contains tabs: 'Maintenance', 'Status', 'Remaining', 'History', and 'Info'. The 'Status' tab is selected. The main display area shows '[Idle]' and 'Last measurement' with two columns of data: '08:09' and '08:04'. The first column shows '0.02 mg/L PO4-P' for S01 (ID: 22222222). The second column shows '1.02 mg/L PO4-P' for S02 (ID: 22222222). Below this, it lists 'Next measurement S01 in: 6 min', 'Next measurement S02 in: 1 min', 'Next cleaning in: 22 h 47 min', and 'Next calibration in: 23 h 47 min'. At the bottom, it says 'Select ↕, exit with ESC'. Two arrows on the right side of the screen point to the 'Status' tab (labeled '1') and the left and right arrow keys (labeled '2').

*figure 4-1 Alyza menu tab Status*

- 1 Tabs form the first menu level in the Alyza menu
  - To switch between the tabs, use the arrow keys << >> <> >.
  - Information, submenus and functions of the selected tabs are displayed.
  - To switch between the displayed information, submenus and functions within a tab, use the arrow keys <▲ ><▼ >.
  - Open the submenus with <OK>.
- 2 Arrows on the side of the screen
  - More tabs can be accessed with the arrow keys << >> <> >.
  - With the arrow keys <▲ ><▼ > you can access further information within a tab.

In the Alyza menu,

- you have access to information on the current operating condition (tabs *Status*, *Remaining*, *History*, *Info*)
- you can start the calibrating and service functions (tab *Maintenance*), e.g.
  - stop or start the Alyza IQ

- Activate or terminate the maintenance condition
- Start calibration
- Start the service functions

## 4.2 Measurement operation

### 4.2.1 Determination of measured values

The Alyza IQ determines the measured values with a chemical analyzing procedure. Each measurement takes place in several steps.

- 1 Draw sample and rinse the measuring circle with sample
- 2 Measure the absorbance of the sample without reagent (blank value)
- 3 Dose the reagent
- 4 Leave to react for the reaction time
- 5 Measure the absorbance of the sample with reagent (color value)

The measured values are determined at intervals specified in the settings (see section 4.3, [78](#)).

If the intervals overlap with the specified start times and intervals of other functions (*Autom.cleaning* or *Autom.calibration*), the functions are carried out according to their priority (see section 4.3, [78](#)).

### 4.2.2 Starting the measuring operation

The Alyza IQ starts measuring only when the *START Alyza IQ* function is started.

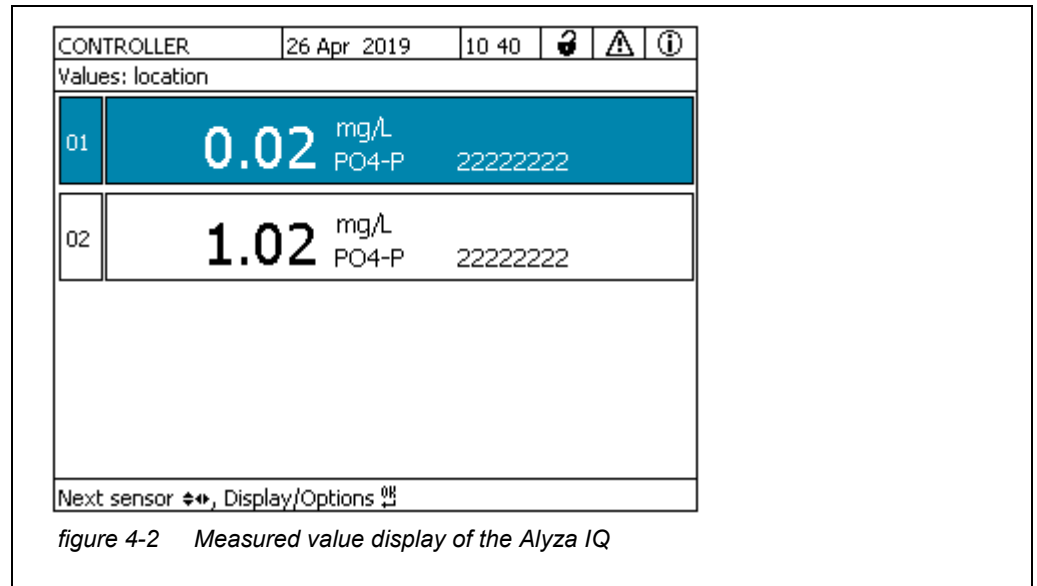
When the Alyza IQ is started (function *START Alyza IQ*), it checks automatically whether the requirements for measurement are met, e.g.:

- Liquids in the tubes
- Temperature control of the various areas of the Alyza IQ  
The regulating of the temperature may take up to 30 minutes.

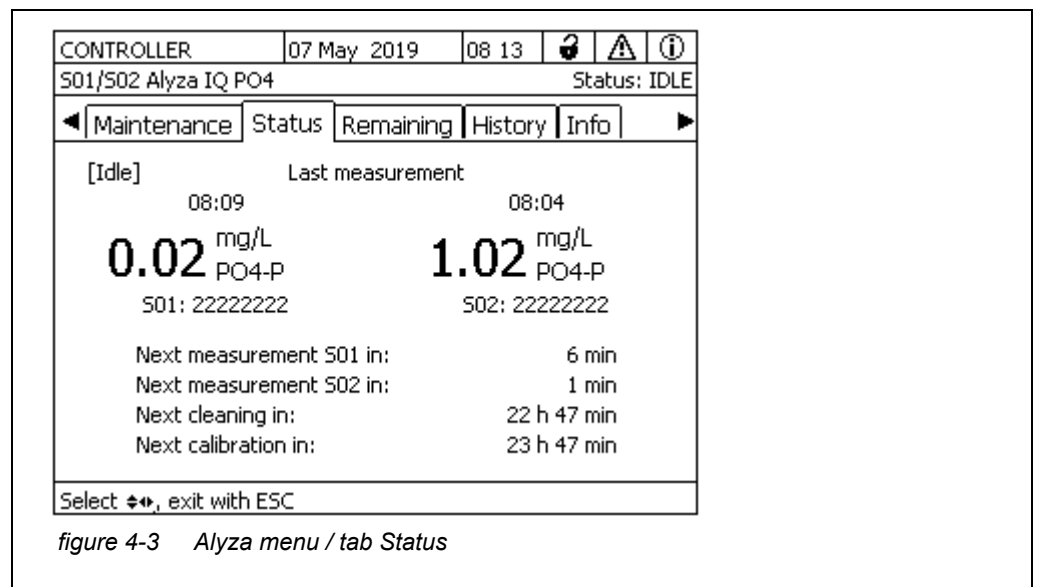
For further details, see section 3.4.3 Preparing the Alyza IQ for measuring, [73](#).

### 4.2.3 Measuring

The measured values are displayed in the measured value display on the terminal.



The current Alyza IQ measured values are also displayed in the Alyza menu / tab *Status*. More detailed information on the current status is available here, (e.g. next measurement, next cleaning, next calibration).



During an automatic cleaning or calibrating procedure, the display shows CLEAN or CAL instead of a measured value. Linked outputs are frozen.

Measured value display	Function
CLEAN	<i>Autom. cleaning</i> is being carried out.
CAL	<i>Autom. calibration</i> is being carried out.

### 4.3 Settings for the Alyza IQ

For the Alyza IQ, the settings are done like that for the other IQ SENSORNET sensors in the menu *Settings of sensors and difference sensors* (IQ SENSORNET measured value display / <S> / Settings of sensors and difference sensors). Start the measuring operation so the measured values of the Alyza IQ can be displayed (see section 4.2.2 Starting the measuring operation, 76).

**IQ SENSORNET  
Settings of  
sensors and  
difference sensors**

- 1 Use the <M> key to switch to the measured value display as necessary.
- 2 Using <▲▼>, select the Alyza IQ in the measured value display as necessary.
- 3 Using <S>, switch from the measured value display to the main menu of the sensor settings.
- 4 Then navigate to the menu "Settings of sensors and difference sensors".  
The exact procedure is given in the IQ SENSORNET system operating manual.
- 5 Adjust the setting values as necessary.

**Setting table** Setting menus with the possible values to be set. Default values are marked in bold.

Setting menu (PO4)	Possible values	Description
<i>Measuring mode</i>	<b>PO4-P</b> PO4	The measured parameter is displayed in the selected citation form.

Setting menu (PO4)	Possible values	Description
<p><i>Measuring range</i></p> <p>With the setting <i>Measuring mode: PO4-P</i></p> <p>With the setting <i>Measuring mode: PO4</i></p>	<p><b>0.02 .. 15.00 mg/L</b> 0.2 ... 50.0 mg/L 0.02 ... 15.00 ppm 0.2 ... 50.0 ppm 0.6 ... 480.0 umol/L 6 ... 1600 umol/L</p> <p><b>0.06 .. 46.00 mg/L</b> 0.6 ... 153.0 mg/L 0.06 ... 46.00 ppm 0.6 ... 153.0 ppm 0.6 ... 480.0 umol/L 6 ... 1600 umol/L</p>	<p>Depending on the <i>Measuring mode</i> setting, different measuring ranges can be selected.</p> <p>For each measured parameter, a low (MR1) and a high measuring range (MR2) can be selected.</p> <p>On changing the measuring range another cell must be installed in the photometer.</p> <p>In addition, other ChemBags have to be installed.</p>
<p><i>Offset correction</i></p> <p>With the setting</p> <ul style="list-style-type: none"> <li>● <i>Measuring mode PO4-P</i> and</li> <li>● <i>Measuring range 0.02 .. 15.00 mg/L</i> (low MR)</li> </ul> <p>With the setting</p> <ul style="list-style-type: none"> <li>● <i>Measuring mode PO4-P</i> and</li> <li>● <i>Measuring range 0.2 ... 50.0 mg/L</i> (high MR)</li> </ul>	<p>- 0.50 ... <b>0.00</b> ... + 0.50 mg/L</p> <p>- 5 ... <b>0</b> ... + 5 mg/L</p>	<p>For other measuring modes and measuring ranges, the value ranges are adjusted.</p>

Setting menu (general settings)	Possible values	Description
<i>Meas. interval</i>	5*, <b>10</b> , 15, 20, 30, 45, 60 min 2, 4, 6, 8, 12 h	Measuring interval * only for the low measuring range (MR1)
<i>Damping</i>	<b>Off</b> <i>Signal smoothing</i> <i>median filter</i>	Methods for filtering the signals A signal filter in the sensor reduces the limits of variation of the measured value.

Setting menu (general settings)	Possible values	Description
With the setting <i>Signal smoothing:</i>  <i>Response time t90</i>	<b>100</b> , 200, 300, 400 s	The signal filter is essentially characterized by the response time t90. Response time of the signal filter (in seconds). This is the time after which 90 % of a signal change is displayed.
With the setting <i>median filter</i>		The instrument displays the median of the last 3 measurements as the measurement value.
<i>Autom. cleaning</i>	<i>On</i> <b>Off</b>	Switches the automatic cleaning function on or off
● <i>Interval</i>	6, 12, <b>24</b> , 48, 96	Interval in h
● <i>Ref.time hours</i>	0... <b>7</b> ...23	Defines the start time from which the automatic cleaning procedures will take place at the set interval (default setting: 7:00 o'clock)
● <i>Ref.time minutes</i>	<b>0</b> ...59	
● <i>Conditioning count of steps</i>	<i>On</i> 1...10 <b>Off</b>	Adjustable number of rinses subsequent to cleaning.
<i>Autom. calibration</i>	<i>On</i> <b>Off</b>	Switches the automatic calibration function on or off
● <i>Procedure</i>	<b>1 Point</b> 2 Point	<p>Number of calibration points for automatic calibration.</p> <p>With the measured values deviating more and more from the nominal value of the calibration standard of the 1-point calibration, the measured values become more inaccurate. If the measuring accuracy is not sufficient with 1-point calibration (no determination of the slope), activate 2-point calibration.</p> <p>PLEASE NOTE:</p> <ul style="list-style-type: none"> <li>● For 1-point calibration the ChemBag at the connector S1 is always used.</li> <li>● For 2-point calibration, an extra tube and an extra ChemBag have to be installed (see section 5 Maintenance and cleaning, 95).</li> </ul>



Setting menu (general settings)	Possible values	Description
<ul style="list-style-type: none"> <li>● <i>Interval</i></li> <li>● <i>Ref.time hours</i></li> <li>● <i>Ref.time minutes</i></li> </ul>	6, 12, <b>24</b> , 48, 96, 2	Interval in h
	0... <b>8</b> ...23	Defines the start time from which the automatic calibration procedures will take place at the set interval (default setting: 8:00 o'clock)
	<b>0</b> ...59	
<i>Backgr. corr.(opt)</i>	<i>On</i> <i>Off</i>	Especially with low concentrations, the standard background correction does not sufficiently compensate for some interferences (e.g. due to colorations, humins). In this case, activate the optimized background correction.  PLEASE NOTE: For the optimized background correction, an extra tube and an extra Chem-Bag have to be installed (see section 5 Maintenance and cleaning, 95).
<i>Autost.after PwrOff</i>	<i>On</i> <i>Off</i>	Activate or switch off the automatic start of the Alyza IQ after a power failure
<i>Sample channel</i>	1 2 1+2	Setting of the sample channel from which the sample should be measured. PLEASE NOTE: If channel 2 or 1+2 is selected, channel 2 has to be installed (overflow vessel and filtration pump). If sample only from one channel should be measured, the sample from channel 1 is measured.
<i>Save and quit</i>		The Alyza IQ stores all changed settings and the display switches to the next higher level.
<i>Quit</i>		The display switches to the next higher level without storing the new settings.



The *Autom.cleaning*, *Autom.calibration* and *Meas. interval* settings may result in the overlapping of the carrying out of different functions.

In this case, the functions are carried out according to priority.

**Priority**

Function	Priority	Duration (min)
<i>Autom. cleaning</i>	1	6 (1-channel variant) 12 (2-channel variant)
<i>Autom. calibration</i>	2	6
Measuring	3	5

**4.4 Calibration**

**4.4.1 Overview**

**Why calibrate?** During operation, individual components of the Alyza IQ can age or become dirty with time and thus change their characteristics, e.g.:

- Flow-through cell
- LED of the photometer
- Photo diodes
- Color reagent

Regular automatic or manual calibration procedures help you to recognize any changes of the measuring characteristics of the Alyza IQ.

**When to calibrate?** Calibrate at regular intervals.

**1-point calibration** The offset of the characteristic curve is adjusted with a regular 1-point calibration.

**2-point calibration** The slope and offset of the characteristic curve are adjusted with a 2-point calibration. Any calibration can be carried out fully automatically at regular intervals. An additional, manual calibration can be started in the Alyza menu (tab *Maintenance / Manual functions*) at any time. See section 4.4.2 Calibration, 83.

**Calibration record / calibration history** The result of a calibration is stored in the calibration history (see Alyza menu / tab *History / Calibration history*).

**Maintenance condition** During the calibration procedure the Alyza IQ on the IQ SENSORNET is in the maintenance condition. All linked outputs remain in their current status. After a manual calibration has been finished the maintenance condition has to be switched off manually. More detailed information on the maintenance condition is given in the respective IQ SENSORNET system operating manual.



You can also switch off the maintenance condition in the Alyza menu / tab *Maintenance*.

**Calibration steps** Each calibration procedure takes place in several steps:

- 1 Draw calibration standard and rinse the measuring circle with calibration standard.
- 2 Measure the absorbance of the calibration standard without reagent (blank value).
- 3 Add the reagent.
- 4 Leave to react for the reaction time.
- 5 Measure the absorbance of the calibration standard with reagent.
- 6 Drain the measuring circle.

#### 4.4.2 Calibration

##### **Automatic calibration**

Automatic calibration is carried out in the measuring operation at regular intervals.

The setting of the calibration interval and calibration time is done in the menu *Settings of sensors and difference sensors* (see section 4.3 Settings for the Alyza IQ, 78).

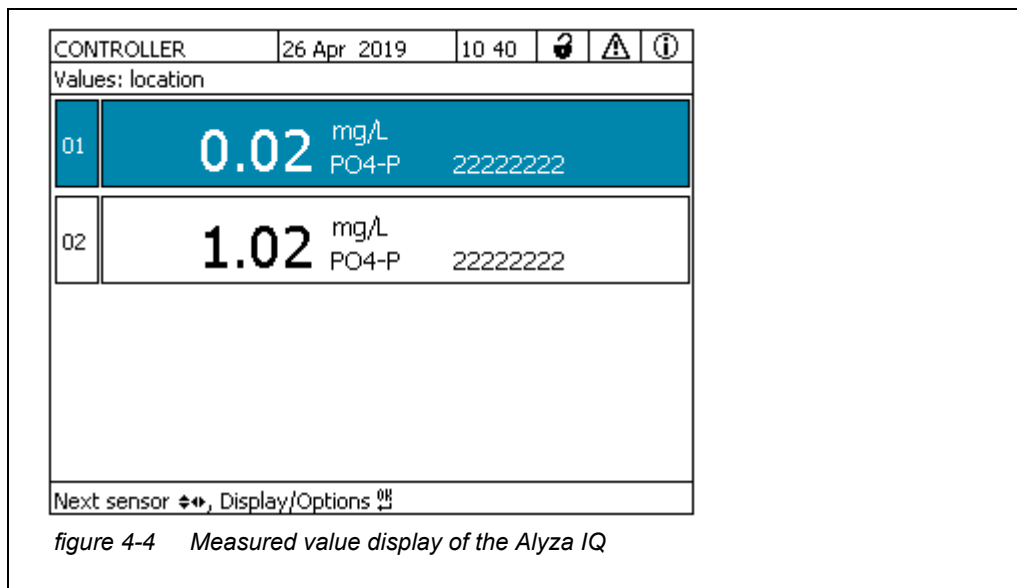
##### **Manual calibration**

The manual calibration procedure can be started manually at any time if necessary. The calibration procedure is started, and the setting of the standard used is made, in the Alyza menu.

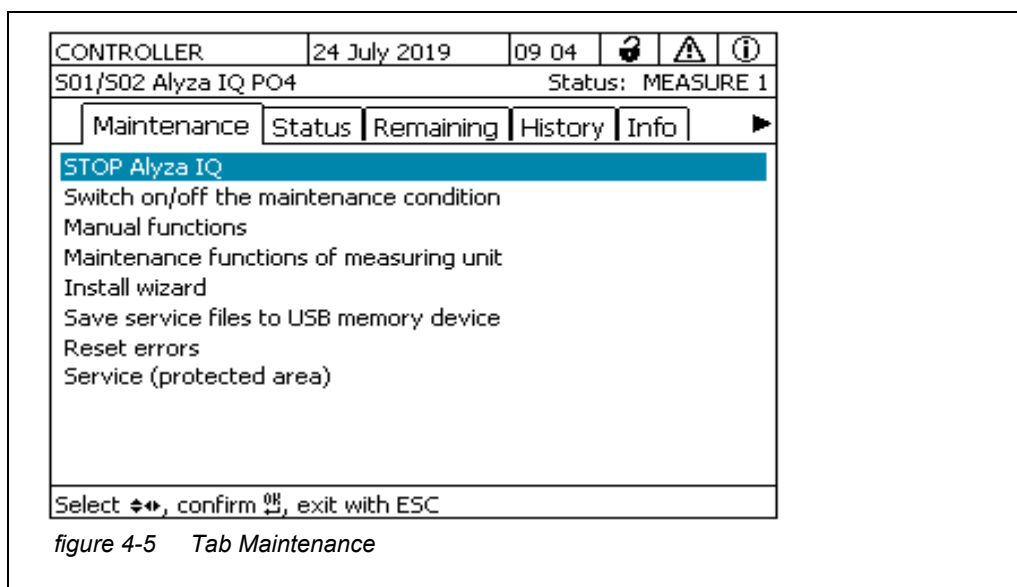
Proceed as follows to start a calibration procedure manually:

##### **Stopping running operation**

- 1 In the measured value display, use <▲▼> to select the Alyza IQ.



- 2 Using <C>, open the Alyza menu.
- 3 Using <left>, switch to the Maintenance tab.



- 4 Carry out the STOP Alyza IQ function to stop the running operation.
- 5 Select Finish current action and then stop.  
The maintenance condition is automatically activated in the IQ SENSORNET for the Alyza IQ.
- 6 Open the menu item Manual functions.

**Carry out calibration**

- 7 Carry out the function / *Calibrate (1-point)* or *Calibrate (2-point)*. For 1-point calibration the ChemBag at the connector S1 is always used.  
The calibration procedure runs automatically.  
The calibration result is displayed after the calibration standards have been measured.



You have the following possibilities if the calibration failed:

- Repeat the calibration procedure (make sure that the correct calibration standard is connected and selected for calibration).
- Use the last valid calibration (see section 4.4.4 Reactivating the last valid calibration, 86 )
- Use the factory settings (see section 4.4.4 Reactivating the last valid calibration, 86)

**Possible calibration results**

The calibration data are evaluated by the system. A calibration procedure can have the following results:

Display after calibrating	Log book entries (meaning/actions)
Measured value	Successful calibration
"----"	Sensor could not be calibrated. Sensor blocked for measurement. <ul style="list-style-type: none"> <li>● Carry out maintenance activities immediately (see operating manual).</li> <li>● View the calibration history.</li> <li>● Check the calibration conditions and calibration standard.</li> </ul>

**Restarting the measuring operation**

- 8 Carry out the *START Alyza IQ* function. Measurement is started and the measured value is displayed in the measured value display after approx. 5...7 minutes.
- 9 Carry out the *Switch off the maintenance condition* function. The maintenance condition is terminated in the IQ SENSORNET for the Alyza IQ.
- 10 In the Alyza menu, use <▶ > to switch to the *Status* tab. The measured value display appears. While no valid measured value is available, the display shows bars «- - -».

### 4.4.3 Calibration history

The calibration history of the Alyza IQ is available in the Alyza menu (tab *History / Calibration history*).

Example and explanation of a calibration history (see section 4.5.3 Information on maintenance activities and calibration procedures (tab History), 90)

### 4.4.4 Reactivating the last valid calibration

#### Manual calibration unsuccessful

If a manual calibration procedure is unsuccessful, the measuring operation can only be resumed once a valid calibration was carried out or reactivated. Thus you can immediately continue to measure if a calibration failed or you suspect that the calibration conditions were not optimally met.

#### Automatic calibration unsuccessful

If an automatic calibration is unsuccessful, the last valid calibration is automatically reactivated. If three calibration procedures in succession are unsuccessful, the measuring operation can only be resumed once a valid calibration was carried out or manually reactivated.



Reactivating old calibration data is a temporary measure. Take into consideration that the sensor may provide wrong measured values. Ensure the correct functioning of the sensor by checking and/or recalibrating it.

- 1 In the measured value display, use <▲▼> to select the Alyza IQ.
- 2 Using the <C> key, switch to the Alyza menu.
- 3 Using <◀>, switch to the *Maintenance* tab.
- 4 Carry out the *STOP Alyza IQ* function.
- 5 Carry out the *START Alyza IQ* function.  
A menu pops up with the following options:
  - *Repeat calibration*
  - *Use factory calibration*
  - *Use last valid calibration*
  - *Show calibration details*
- 6 Select *Use last valid calibration* or *Use factory calibration*.
- 7 Switch off the maintenance condition.  
The measured value is displayed after approx. 5...7 minutes.

## 4.5 Information on the Alyza IQ

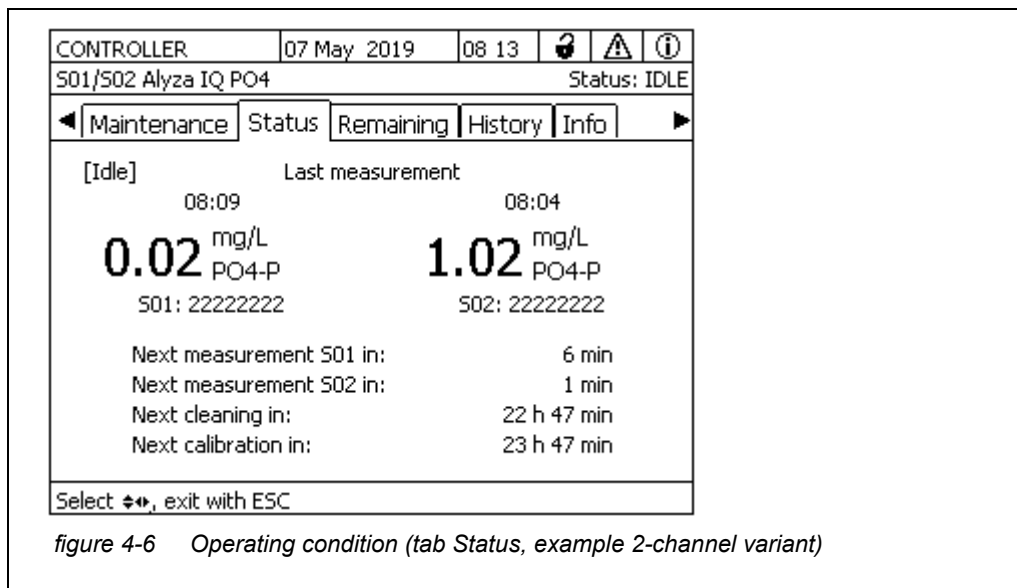
In the Alyza menu, there is comprehensive information available on the current status of the Alyza IQ:

- Current operating condition (measuring, calibration, etc.)
- Schedule for the next interval-controlled actions, e.g. measuring, calibrating, cleaning (tab )
- Schedule for the exchange of ChemBags (tab *Remaining*)
- Schedule for the execution of maintenance activities, e.g. replacement parts (tab *History / Installed replacement parts*)
- Documentation of the maintenance activities carried out (tab *History / Maintenance history*)
- Documentation of the calibration procedures (Tab *History / Calibration history*)
- More information on the Alyza IQ (tab *Info*)
  - Current measured values of sensors (e.g. temperature, etc.)
  - Current statuses (e.g. heating, ventilator, cooling, etc.)
  - Software versions of individual components of the Alyza IQ
  - Serial numbers of individual assembly groups

- 1 In the measured value display, use <▲▼> to select the Alyza IQ.
- 2 Using the <C> key, switch to the Alyza menu.
- 3 Using <<>>>, open one of the tabs with information on the Alyza IQ:
  - *Status* (see section 4.5.1, 87)
  - *Remaining* (see section 4.5.2, 88)
  - *History* (see section 4.5.3, 90)
  - *Info* (see section 4.5.4, 93)

### 4.5.1 Information on the current operating condition (Tab *Status*)

During measuring operation, the information on the current operation condition comprises the current measured values and also the schedule for the next interval-controlled actions, e.g. measuring, calibrating or cleaning.



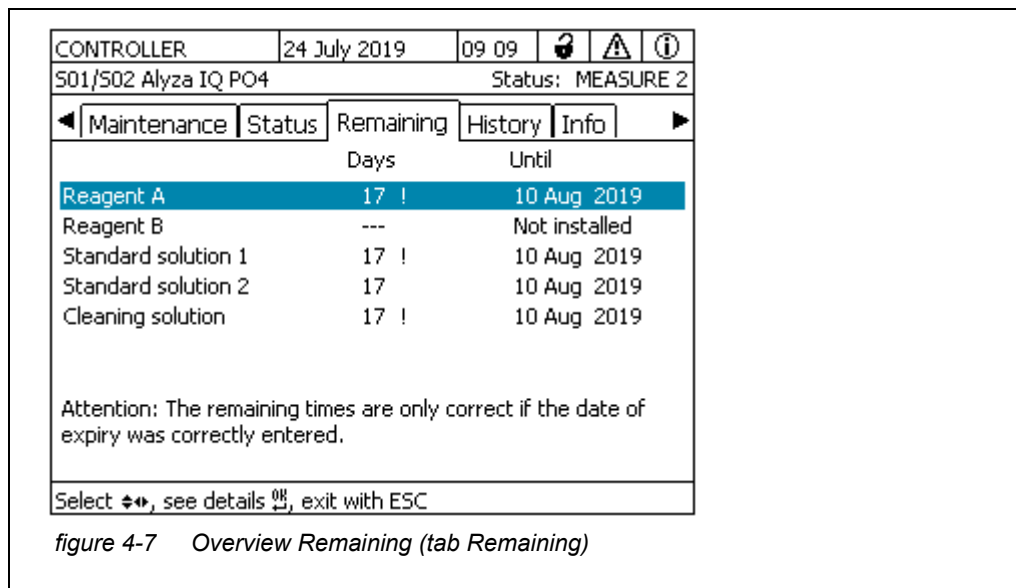
In the *Status* tab, the following information on the current operating condition is available:

- Current operating condition (e.g. measuring, calibration, etc.)
- Measured value of the last measurement with date and time
- Schedule for the next interval-controlled action, e.g. measuring, calibrating and cleaning

#### 4.5.2 Information on the expected lifetimes of replacement parts (tab *Remaining*)

The *Remaining* tab provides a quick overview of the maintenance activities due. This information facilitates the planning and co-ordination of the maintenance activities for the most important replacement parts (chemicals and MultiPort valve) of the Alyza IQ.





The estimated times remaining until the next exchange are shown in days in the overview. In addition

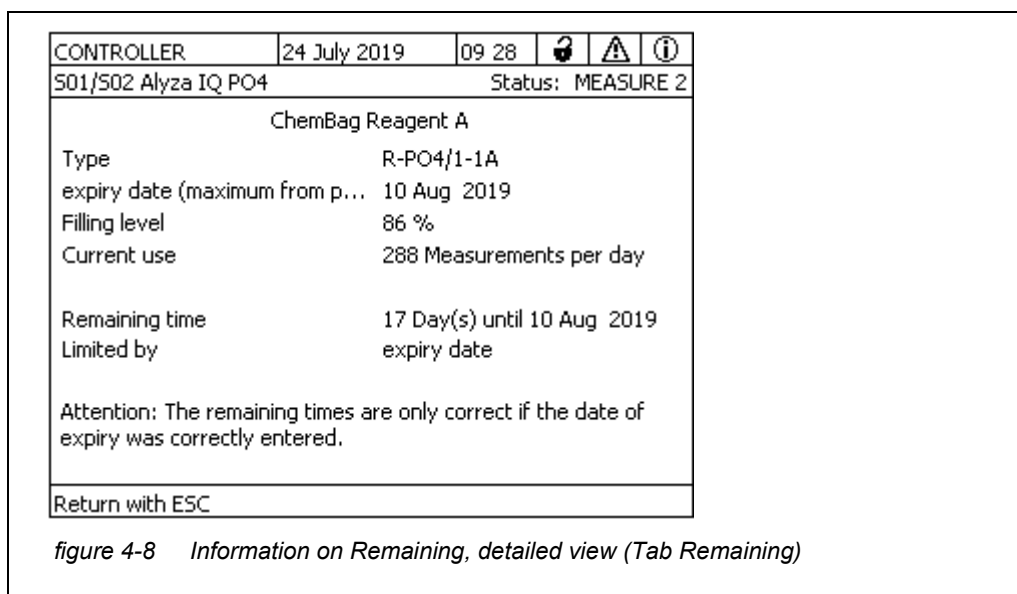
Remaining time	Signal
< 30 d	! (next to remaining time)
< 7 d	! (flashes next to remaining time)
< 0 d	📅 (calender sheet)



The remaining times can only be stated correctly if

- The exchange is done via the maintenance menu
- full ChemBags or new replacement parts are installed
- the expiry date printed on the ChemBag is correctly entered

More details on the lifetime of a replacement part can be opened with **<OK>** .



#### 4.5.3 Information on maintenance activities and calibration procedures (tab *History*)

The Alyza IQ histories provide an overview of the replacement parts installed, the maintenance activities carried out, and the calibration procedures performed.

- *Installed replacement parts*  
(list of the replacement parts installed with installation date and the expiry date entered)
- *Calibration history*  
(list of the last calibration procedures with the relevant calibration data)

**Installed replacement parts**

CONTROLLER	07 May 2019	08 04			
S01/S02 Alyza IQ PO4			Status: MEASURE 2		
Installed replacement parts					
Part	Installation	Use by			
MultiPort valve (MPV)	15 Mar 2019	15 Oct 2019			
Reagent A R-PO4/1-1A	15 Mar 2019	16 May 2019			
Reagent B R-PO4/1-1B	01 Apr 2019	18 May 2019			
Standard solution 1	15 Mar 2019	15 Aug 2019			
Standard solution 2	01 Apr 2019	01 July 2019			
Cleaning solution C-PO4/1-1	15 Mar 2019	17 May 2019			
Scroll , help , return with ESC					

*figure 4-9 Installed replacement parts (tab History / Installed replacement parts)*

The list *Installed replacement parts* shows a list of all components that have to be replaced regularly, i.e. when the use-by period has expired. The installation date and expiry date of a component are recorded when the component is installed. These data are documented.

**Calibration history** The *Calibration history* list shows the last calibration results (details see section 4.4.3, 86).

CONTROLLER		07 May 2019	08:20	🔍 ⚠️ ⓘ		
S01/S02 Alyza IQ PO4		Status: IDLE				
Calibration history						
Date	Time	Srel	OSType	STD	MR	OK
30 Apr 2019	08:10	1.00	0 F	1/0	1	+
30 Apr 2019	08:10	---	0 M	1/--	1	+
29 Apr 2019	08:10	---	0 M	1/--	1	+
28 Apr 2019	08:10	1.00	5 M	0/10	1	+
27 Apr 2019	08:10	1.00	5 M	0/10	1	+
26 Apr 2019	08:10	---	0 M	1/--	1	+
25 Apr 2019	08:10	---	0 M	--/10	1	+
24 Apr 2019	08:10	---	0 M	1/--	1	+

Scroll ⬅➡, help ⓘ, return with ESC

Current calibration data

Chronological list of the last calibration procedures

*figure 4-10 Calibration history Alyza IQ*

The calibration history provides the following information:

- **Date** and **time** of the calibration
- **Srel** (relative slope, is determined with 2-point-calibration)
  - Value without asterisk (\*):  
the slope was determined (2-point calibration)
  - \* value with asterisk (\*) :  
the slope was not determined (1-point calibration);  
the last active slope was taken over unchanged
- R: reference slope
- **OS** (offset, is determined with 1- and 2-point calibration)
- **Type**
  - M: Manual calibration
  - A: Automatic calibration
  - F: Factory setting
- **STD** (concentration in mg/l of the calibration standards used)
- **MR** (measuring range 1 [low] or 2 [high])
- **OK** (evaluation of the calibration result):
  - + successful calibration.  
The new calibration data are taken over for measurement.
  - calibration unsuccessful.  
Sensor blocked for measurement.
  - ? : The last valid calibration or  
factory setting was taken over

#### 4.5.4 More information on the Alyza IQ (Tab *Info*)

In the *Info* tab there is more information on the Alyza IQ, which may be helpful in the case of errors or implausible measured values. The following information is displayed:

- Temperature control (temperature, functioning of the ventilators, heating units, cooling unit)
- Software statuses (control units ACM, ACS, etc.)
- Serial numbers of individual components

CONTROLLER	07 May 2019	08 24			
S01/S02 Alyza IQ PO4		Status: MEASURE 2			
<div style="display: flex; border-bottom: 1px solid black;"> <span style="margin-right: 10px;">◀ Maintenance</span> <span style="margin-right: 10px;">Status</span> <span style="margin-right: 10px;">Remaining</span> <span style="margin-right: 10px;">History</span> <span style="border: 1px solid black; padding: 2px;">Info</span> </div>					
Measuring mode	PO4-P				
Measuring range	0.02 .. 15.00 mg/L				
Temperature of housing interior T1	25.0 °C				
Outside temperature T2	25.0 °C				
Temperature of measuring unit T3	20.0 °C				
Temperature of photometer T4	45.0 °C				
Heating of housing interior HZ1	0 %				
Heating of measuring unit HZ2	0 %				
Photometer heating HZ3	100 %				
Top fan (housing) FN1	Off				
Cooling unit inside fan FN2	On ▼				
Select ↔, exit with ESC					

*figure 4-11 Info (tab Info)*

#### 4.6 Software update for the Alyza IQ

With a Software-Update you can always update your Alyza IQ to the latest status of the instrument software.

For the update packet with the current instrument software for the Alyza IQ as well as a comprehensive manual on how to carry out the update, go to [www.YSI.com](http://www.YSI.com).



The Software-Update for the Alyza IQ is included in the update packet for the IQ SENSORNET.



The software versions of all components can be viewed in the dialog box *List of all components* (see system operating manual).

The Alyza IQ is an IQ SENSORNET component with separate USB interface.

- 1 Download the software update IQ SENSORNET "Update Pack (L1)" and store the directories to a USB memory device.
- 2 Remove the cover of the control unit ACM.  
To do so, unscrew the two knurled-head screws.
- 3 Plug the USB memory device with the software update IQ SENSORNET "Update Pack (L1)" to the USB interface "USB0".
- 4 On the terminal, switch to the measured value display of the IQ SENSORNET.
- 5 In the service menu, start the software update (component with USB interface).



A Software-Update does not change any measurement settings, measurement data or calibration data.

Beeps indicate the status of the update for the Alyza IQ during a software update:

Beeps	Status of the update	Next step
Beeps approx. every 3 seconds	The software update of the Alyza IQ is being carried out	Wait for the software update to be completed: Signal for the end of the update: 3 short beeps (see below) or 3 long beeps (see below)
3 short beeps (quickly one after the other)	The software update of the Alyza IQ is completed	<ul style="list-style-type: none"> <li>● Remove the USB memory device and the USB plug (second USB connector). The Alyza IQ automatically restarts.</li> <li>● Plug the internal USB cable into the unlabeled USB connector again</li> </ul>
3 long beeps (quickly one after the other)	The software update was not successful	<ul style="list-style-type: none"> <li>● Remove the USB memory device and the USB plug (second USB connector). The Alyza IQ automatically restarts with the old software.</li> <li>● If necessary, check the data on the USB memory device.</li> <li>● Repeat the software update</li> </ul>

## 5 Maintenance and cleaning

### 5.1 Hazard warnings

#### 5.1.1 General notes

Read the chapter 2 Safety instructions, 24 before doing any maintenance work. This is important for your personal safety.

#### **NOTE**

*The interior of the measuring unit is temperature-controlled to 20 °C. With ambient temperatures over 25 °C, condensation water may develop on the cool surfaces and cause damage when the measuring unit is opened. To avoid damage of the measuring unit due to the formation of condensation water, always wait for the temperature adjustment (function "Prepare to open measuring unit") to be completed before opening the measuring unit.*

#### 5.1.2 Risks when handling the ChemBags



#### **WARNING**

**Dangerous chemicals.**  
Improper use of chemicals can cause damage to your health.

Heed the following rules:

- Read the labels of the chemicals containers and follow the safety instructions
- Wear protective equipment (lab coat, protective goggles, chemical resistant protective gloves, safety shoes)

#### **Notes on safely handling the ChemBags**

- If a ChemBag was damaged in the transport packaging, e.g. visibly leaked liquid, do not use this ChemBag in the Alyza IQ.
- Make sure you don't damage the ChemBags when unpacking them from the transport packaging.
- Do not use any sharp object when dealing with (or unpacking) the ChemBags.
- If possible, handle the ChemBags gripping only the cap in order not to kink the ChemBags.

### 5.1.3 Hazards when opening the locking device of the MultiPort valve

**WARNING**

**Dangerous chemicals.**

**Do not open the locking device of the MultiPort valve if the maintenance activities at the measuring unit have not been completed. Leaking chemicals can cause health problems.**

**Heed the following rules:**

- **Carry out all maintenance activities required for the opening of the measuring unit.**
- **Follow the safety instructions.**
- **Wear protective equipment (lab coat, protective goggles, chemical resistant protective gloves, safety shoes)**

**NOTE**

*Leaking chemicals in the measuring unit can damage the measuring unit.*

*To prevent the measuring unit from being damaged by leaking chemicals, carry out the following steps before opening the locking device of the MultiPort valve:*

- *Execute the function "Prepare to open measuring unit".*
- *Execute the function "Drain the system".*
- *Put all ChemBag tubes on the tube holder above the locking device.*
- *Fix all ChemBag tubes in the gaps of the tube holder.*

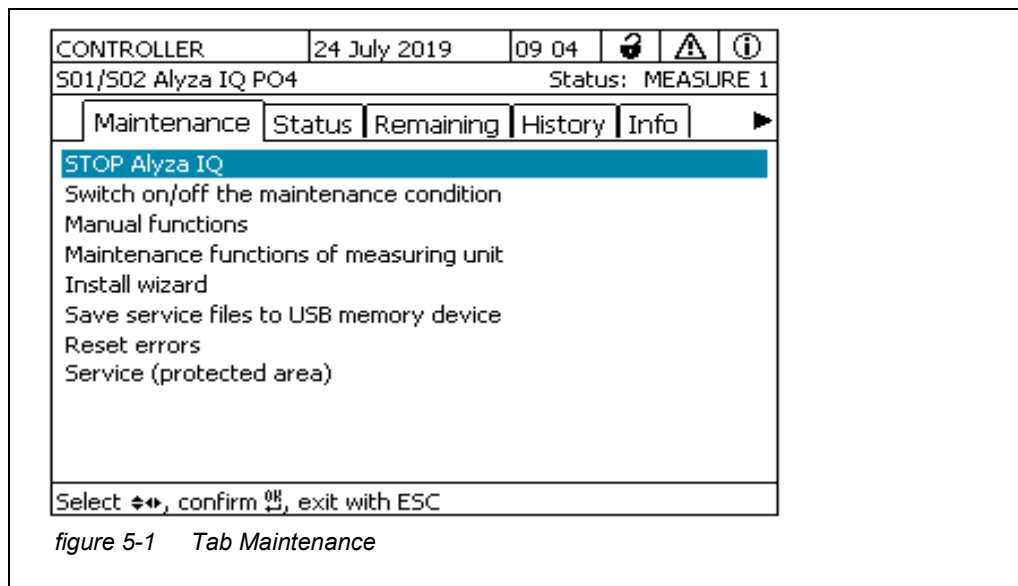
**Hazard free opening of the locking device of the MultiPort valve**

How to prepare the maintenance of the measuring unit is described in detail with the maintenance of the measuring unit (see section 5.5 MAINTENANCE- AND CLEANING ACTIVITIES AT THE MEASURING UNIT).

The most important steps are the following activities:

- 1 In the sensor menu of the Alyza IQ open the tab *Maintenance*





- 2 Carry out the *Switch on maintenance condition* function. On the IQ SENSORNET, the maintenance condition for the Alyza IQ is switched on.
- 3 Carry out the *STOP Alyza IQ* function to stop the running operation.
- 4 Drain all tubes (*Maintenance / Manual functions / Drain the system*).
- 5 Prepare the measuring unit to be opened (*Maintenance / Manual functions / Prepare to open measuring unit*)



For all activities at the open measuring unit:

- Note the environmental conditions (see Abb. 3.3.1, 28).
  - With low ambient temperatures, make sure that the liquids do not freeze while the maintenance activities are carried out. Leave the housing open for as short a time as possible.
  - Open the outer housing door far enough so the arrestable brake-stay catches.
  - Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.
- 6 Put on your personal protective equipment (PPE) and chemical resistant gloves (see section 2.4 Personal protective equipment (PPE), 26).
  - 7 Remove the front cover of the measuring unit. The measuring unit is ready to be opened when the LED of the measuring unit lights up white.

- 8 Put all ChemBag tubes over the tube holder above the locking device and fix the tubes in the spaces of the tube holder.

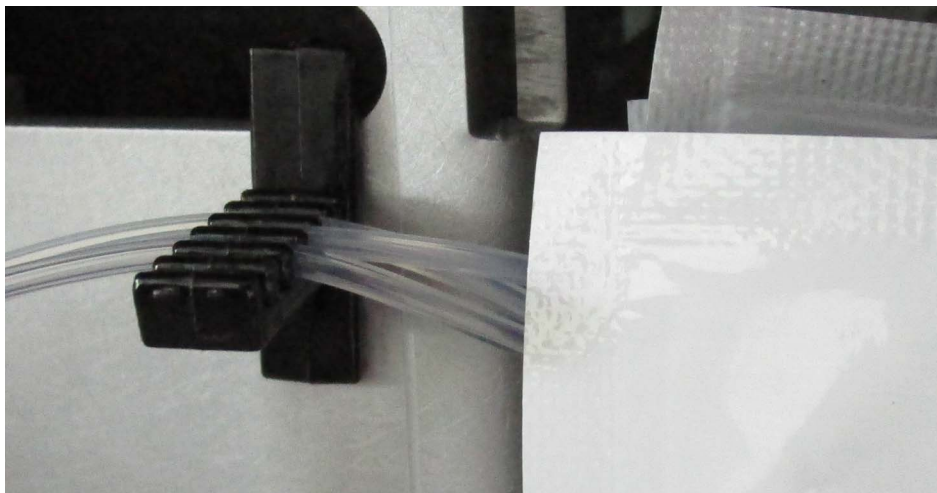


Bild 5-2 Tubes fixed in the tube holder

## 5.2 Replacement parts, accessories

Only use original replacement parts and accessories.

ChemBags are available as sets optimally combined for your application.

The combination as sets takes into account the following factors for your application:

- Measured parameter
- Measuring range
- Quantity of liquid
- Stability

By using the sets you avoid any unsuitable combinations of ChemBags. The amounts of liquids of the sets are thus designed that all ChemBags will be used up at the same time.

ChemBags are also obtainable individually.

### ChemBags

Type	Replacement parts (ChemBag sets)	Order number
R-PO4/1-1A	Reagent for measuring range 1 (MR1, low MR)	827520Y
R-PO4/1-1B	Reagent for measuring range 1 (MR1, low MR)	827521Y

Type	Replacement parts (ChemBag sets)	Order number
R-PO4/1-2A	Reagent for measuring range 2 (MR2, high MR)	827522Y
R-PO4/1-2B	Reagent for measuring range 2 (MR2, high MR)	827523Y
S-PO4/1-0.0	Calibration standard 0.0 for measuring range 1 (MR1, low MR)	827526Y
S-PO4/1-1.0	Calibration standard 1.0 for measuring range 1 (MR1, low MR)	827527Y
S-PO4/1-10.0	Calibration standard 10.0 for measuring range 1 (MR1, low MR) or measuring range 2 (MR2, high MR)	827528Y
S-PO4/1-40.0	Calibration standard 100.0 for measuring range 2 (MR2, low MR)	827529Y
C-PO4/1-1	Cleaning solution	827533Y
R-Set PO4/1-1	Set of reagents for measuring range 1 (MR1, low MR)	827550Y
R-Set PO4/1-2	Set of reagents for measuring range 2 (MR2, high MR)	827551Y
SC-Set PO4/1-1_0/1	Set of calibration standards and cleaning solution for measuring range 1 (MR1, low MR)	827555Y
SC-Set PO4/1-1_0/10	Set of calibration standards and cleaning solution for measuring range 1 (MR1, low MR)	827556Y
SC-Set PO4/1-2_10/40	Set of calibration standards and cleaning solution for measuring range 2 (MR2, high MR)	827557Y



Individual ChemBags:  
Available on the Internet at [www.YSI.com](http://www.YSI.com).

#### Further replacement parts

Type	Replacement parts	Order number
MPV-1	MultiPort valve	827000Y
Syringe Pump Set	Syringe body with holder	827170Y



Further replacement parts and accessories:  
Available on the Internet at [www.YSI.com](http://www.YSI.com).

**Accessories**

Type	Accessories	Order number
WF Set	Mounting set for a waste funnel	827187Y
TM	Mounting set for the terminal holder	822000Y

### 5.3 General maintenance and cleaning activities

#### 5.3.1 Maintenance activities

Maintenance activities have to be done at regular intervals on the Alyza IQ. The following maintenance activities can be performed by the operator.

#### Regular maintenance activities

Regular maintenance		Interval
Measuring unit (simple maintenance activities on site)	Installing/replacing the MultiPort valve (MPV)	Approx. 12 months with a measuring interval of 10 min. Depending on the frequency of the measuring, cleaning or calibrating procedures, the maintenance intervals will be shorter or longer (see section 5.5, <a href="#">104</a> )
	Installing / replacing the ChemBags	Approx. 3 - 6 months, depending on the frequency of measurement, cleaning, calibration (see section 5.5, <a href="#">104</a> )
	Installing/replacing the tubes on the MultiPort valve (MPV)	12 - 24 months (see section 5.5, <a href="#">104</a> )
Measuring unit (complex maintenance activities in the laboratory, after removing the measuring unit)	Installing / replacing the syringe body	Approx. 2 years (see mounting instructions of the syringe body)
	Installing / replacing the tubes of the photometer unit )	as necessary (see mounting instructions of the tubes of the photometer unit)
Sample inlet, outlet	Cleaning the overflow vessel and intake line	12 months (recommended) section 5.6.5, <a href="#">116</a>
	Return line	as necessary
	Waste tube from the photometer	as necessary
Sample filtration	Sample filtration: Cleaning the filter plate (Filter/PC)	2 ... 4 months depending on the application. If cleaning does not help (see section 5.6.4, <a href="#">115</a> )

Regular maintenance		Interval
Housing	Cleaning the filter mats at the housing	Depending on contamination (see section 5.7.2, 120)
	Cleaning the housing	As required (see section 5.7.1, 120)
	Bug screen	As required

**Maintenance activities at the power supply box**

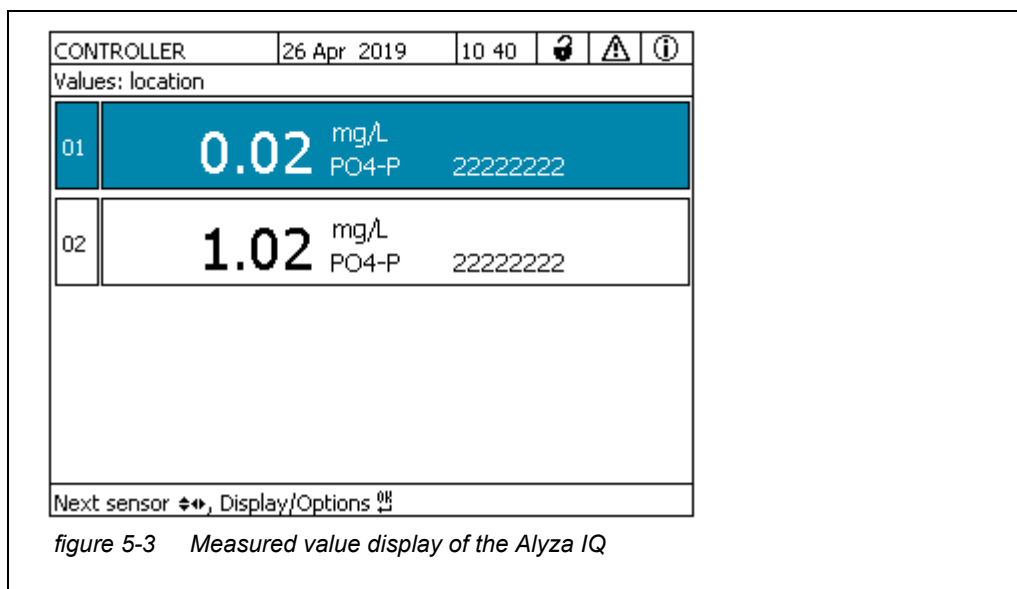
Maintenance activities at the power supply box are only required for work at the heat tracing or power cable (see section 5.8, 124).

**5.4 Carrying out maintenance- and cleaning activities of the liquid circle of the Alyza IQ**

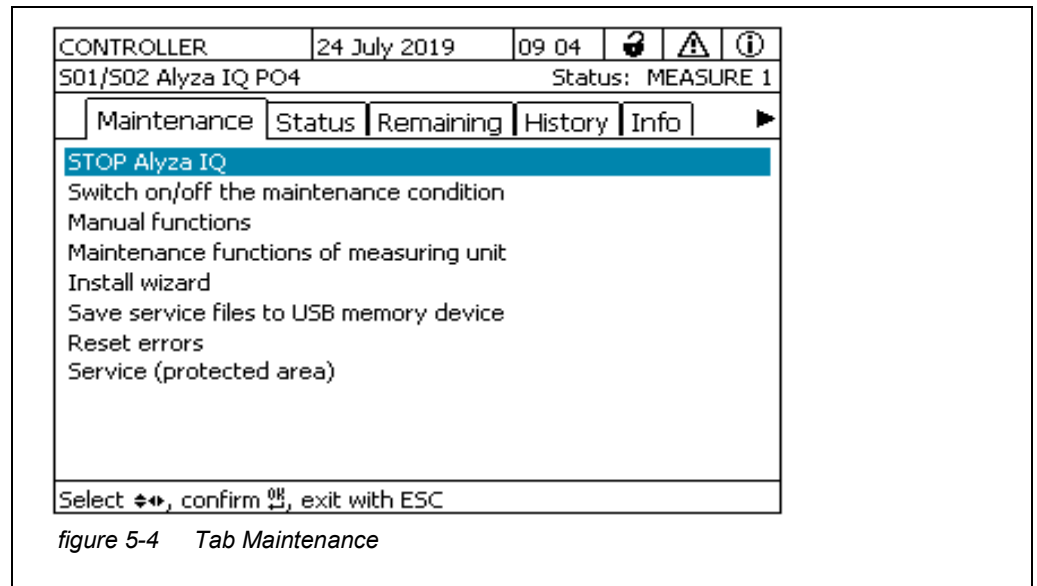
Proceed as follows to carry out maintenance activities of the liquid circle of the Alyza IQ:

**Starting the maintenance routine of the Alyza IQ**

- 1 In the measured value display, use <▲><▼> to select the Alyza IQ.



- 2 Using the <C> key, switch to the sensor menu of the Alyza IQ.
- 3 Using <◀>, switch to the Maintenance tab.



- 4 Carry out the *Switch on maintenance condition* function. On the IQ SENSORNET, the maintenance condition for the Alyza IQ is switched on.
- 5 Carry out the *STOP Alyza IQ* function to stop the running operation.

### Carrying out maintenance activities



#### WARNING

**Dangerous chemicals.**  
Improper use of chemicals can cause damage to your health.

Heed the following rules:

- Read the labels of the chemicals containers and follow the safety instructions
- Wear protective equipment (protective goggles, chemical resistant gloves)



For all activities at the open measuring unit:

- Note the environmental conditions (see Abb. 3.3.1, 28).
- With low ambient temperatures, make sure that the liquids do not freeze while the maintenance activities are carried out. Leave the housing open for as short a time as possible.
- Open the outer housing door far enough so the arrestable brake-stay catches.
- Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.

- 6 Put on your personal protective equipment (PPE) and chemical resistant gloves (see section 2.4 Personal protective equipment (PPE), [26](#)).
- 7 Carry out the intended maintenance activities, such as:
  - Maintenance- and cleaning activities at the measuring unit (see section 5.5 Maintenance- and cleaning activities at the measuring unit, [104](#))
    - MultiPort valve
    - ChemBags
    - Tubes
    - Syringe body
  - Maintenance activities at the sample feed and drain
    - Cleaning the sample feed and overflow vessel (see section 5.6.5 Cleaning the sample feed and overflow vessel, [116](#))
    - Mechanical cleaning of the filter plate (see section 5.6.1 Mechanical cleaning of the filter plate, [111](#))

#### Terminating the maintenance routine

- 8 After maintenance activities at the measuring unit: Close the front cover of the measuring unit and the doors of the Alyza IQ.
- 9 Carry out the *Prepare measuring* function. The temperature control of the Alyza IQ is started. Wait for the temperature of the Alyza IQ to be regulated (display in the tab *Status*).
- 10 Fill the tubes (Alyza menu / tab *Maintenance* / *Manual functions* / *Fill the system* or *Filling (separately)*)
- 11 Calibrate the measuring system with the new replacement parts (Alyza menu / tab *Maintenance* / *Manual functions* / *Calibrate (2-point)*)
- 12 Carry out the *START Alyza IQ* function. Measurement is started and the measured value is displayed in the measured value display after approx. 5...7 minutes.
- 13 Carry out the *Switch off the maintenance condition* function.

### 5.5 Maintenance- and cleaning activities at the measuring unit

The routine maintenance activities at the measuring unit are included in one procedure (MPV, tubes, ChemBags).



**WARNING**

**Dangerous chemicals.**

**Improper use of chemicals can cause damage to your health.**

**Heed the following rules:**

- **Read the labels of the chemicals containers and follow the safety instructions**
- **Wear protective equipment (protective goggles, chemical resistant gloves)**



For all activities at the open measuring unit:

- Note the environmental conditions (see Abb. 3.3.1, 28).
- With low ambient temperatures, make sure that the liquids do not freeze while the maintenance activities are being carried out. Leave the housing open for as short a time as possible.
- Open the outer housing door far enough so the arrestable brake-stay catches.
- Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.

### Maintenance preparation



During the initial commissioning, the install wizard guides you through the maintenance preparation.


Continue with section **INSTALLING THE MULTIPORT VALVE (MPV) AND TUBES** .

- 1 Start the maintenance routine (see section 5.4 Carrying out maintenance- and cleaning activities of the liquid circle of the Alyza IQ, 102) at the terminal.
- 2 Open the *Maintenance functions of measuring unit* menu.
- 3 Select the function, *Prepare to open measuring unit*. Follow the instructions on the display. The procedure starts the temperature adjustment of the measuring unit and the selection of the parts that have to be installed or replaced.
- 4 In the menu *Maintenance functions of measuring unit/Edit list of replacement parts*, select the replacement parts intended for the maintenance .
- 5 If necessary, edit the parts list. While the Alyza IQ is being prepared for maintenance, you can still change the intended maintenance activities (installation or replacement).



The list of replacement parts does not include exchanging the tubes.

### Installing the MultiPort valve (MPV) and tubes

- 6 Drain the tubes (*Maintenance / Manual functions / Drain the system*). If only one tube is exchanged (*Maintenance / Manual functions / Draining (separately)*).
- 7 Put on your personal protective equipment (PPE) and chemical resistant gloves (see section 2.4 Personal protective equipment (PPE),  26).
- 8 Remove the front cover of the measuring unit.  
The measuring unit is ready to be opened when the LED of the measuring unit lights up white.
- 9 Using one hand, grip the handle at the upper edge of the front cover of the measuring unit.
- 10 Pull the front cover of the measuring unit somewhat to the front against the resistance.
- 11 Carefully lift the loosened part of the front cover out to the front.  
Put the front cover down in a clean place.
- 12 Put all ChemBag tubes over the tube holder above the locking device and fix the tubes in the spaces of the tube holder.

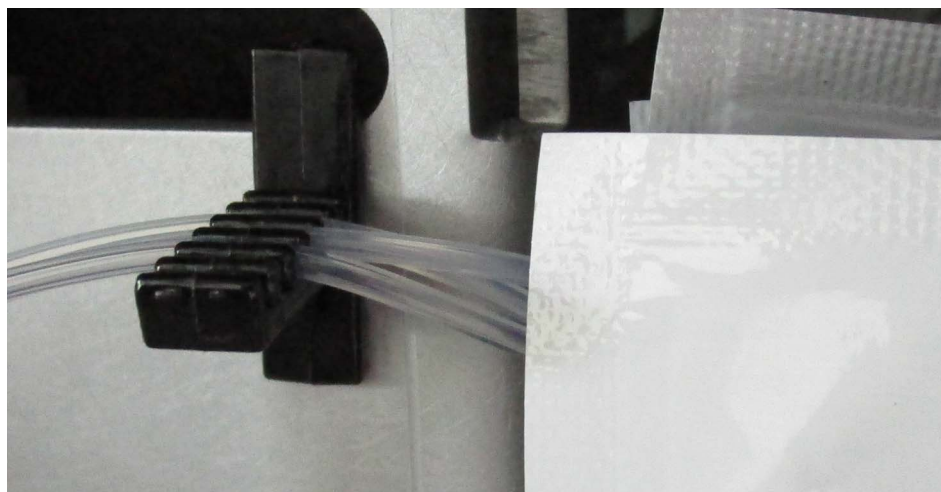


figure 5-5 Tubes fixed in the tube holder

- 13 Open the locking device of the MultiPort valve (MPV).  
Beeps indicate that the locking device is open.  
When the locking device is open there is a risk of leaking chemicals.

**NOTE**

*Leaking chemicals in the measuring unit can damage the measuring unit. To prevent the measuring unit from being damaged by leaking chemicals, carry out the following steps before opening the locking device of the MultiPort valve:*

- *Execute the function "Prepare to open measuring unit" .*
  - *Execute the function "Drain the system".*
  - *Put all ChemBag tubes on the tube holder above the locking device.*
  - *Fix all ChemBag tubes in the gaps of the tube holder.*
- 14 For the initial commissioning of the MultiPort valve:  
Remove the blind plugs from the holder of the MultiPort valve for the required tube connectors of the MultiPort valve.
- 15 For initial installation of a tube at the MultiPort valve (e.g. installing the tubes for standard 2 or reagent B):  
Remove the blind plugs for the additionally required tube connectors from the holder of the MultiPort valve.
- 16 When exchanging the MultiPort valve (MPV) or individual tubes at the MultiPort valve:  
Unscrew any old tubes from the holder of the MultiPort valve. To do so, use the special tool in the base of the measuring unit.
- 17 When exchanging the MultiPort valve (MPV):  
Remove the MultiPort valve.



The tubes of the MultiPort valve can be exchanged individually or as a set:  
The tube set is already in the housing for the initial commissioning.

- 18 Only when exchanging the MultiPort valve (MPV):  
Insert the new MultiPort valve (MPV).
- 19 Connect the tubes to the holder of the MultiPort valve.

Color coding	Connection of
Green (reagent)	MPV - ChemBag R
Orange (calibration standard)	MPV - ChemBag S
Blue (cleaning solution)	MPV - ChemBag C

**NOTE**

*Damaged tubes may leak.*

*Folded or knotted tubes hamper the transport of the liquids.*

*The tubes must not be damaged, folded or knotted.*

20 Screw the new tubes onto the holder of the MultiPort valve.  
Use the special tool for this.

21 Close the locking device of the MultiPort valve (MPV)

**Installing the  
ChemBags**

22 Remove the empty ChemBags from the supporting rod one by one.

23 Turn the ChemBags so that the valve points upward.  
Suspend the tubes of the empty ChemBags from the tube grooves at  
the photometer unit so that the ChemBags are suspended downwards  
from the tubes.

24 Unscrew the coupling of the tube from the ChemBag.

25 Unscrew the protection cap of the ChemBag to be connected. The  
opening points upward.

26 Screw the protective cap onto the empty ChemBag.



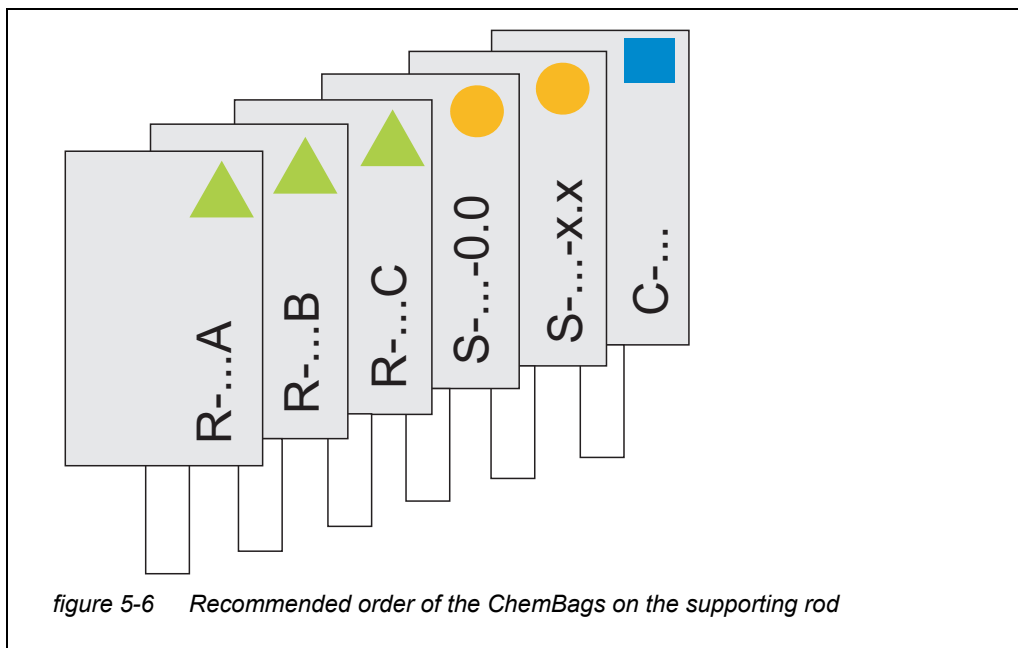
The ChemBags with the longest lifetime do not have to be ex-  
changed often. Suspend them first from the supporting rod and slide  
them to the rear.

Cleaning solution (most often has to longest lifetime)

Standards 1 and 2 (calibration standards)

Reagent B (for optimized background correction, *Backgr. corr.(opt)*)

Reagent A



- 27 Plug the coupling of the connecting tube of the MultiPort valve onto the ChemBag with the suitable coding (symbol, color, number) and screw it tight.

**NOTE**

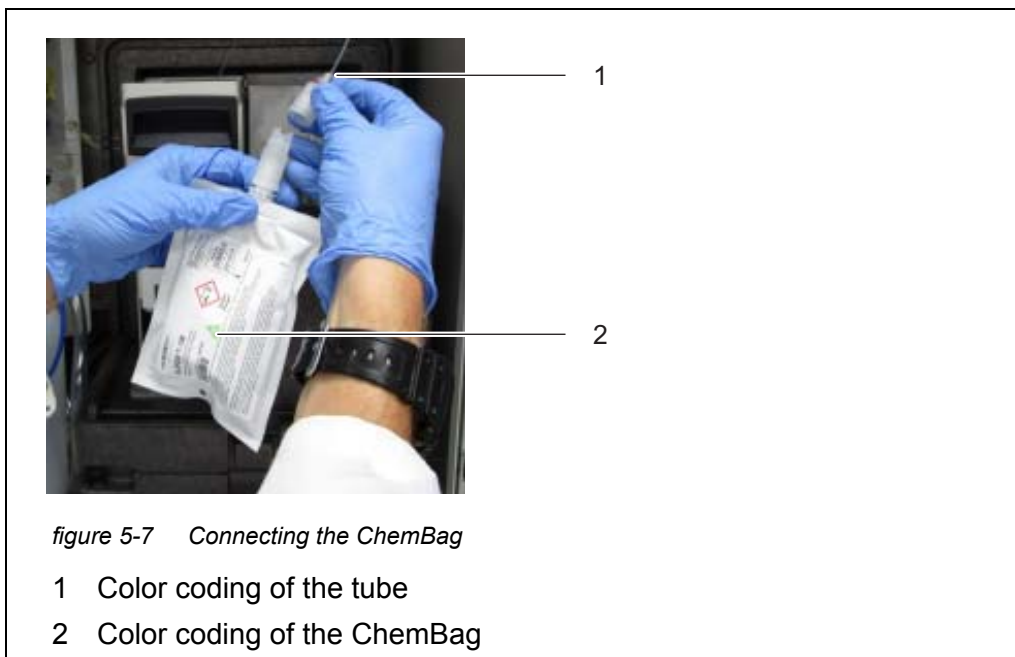
*Damaged ChemBags may leak.*

*To avoid damage, the ChemBags must not be folded near the cap.*

*Hold the ChemBags at the cap, with the liquid downward.*

*To suspend the ChemBags from the supporting rod:*

*Carefully turn the ChemBags upside down, without folding the ChemBags or tubes.*




- 28 Carefully turn the ChemBag upside down. The cap points downward. Slightly knock on the cap of the ChemBag if necessary to remove any small bubbles from the connector. Suspend the ChemBag from the supporting rod.
- 29 Connect all selected ChemBags
- 1 cleaning solution (blue)
  - 1 - 2 standard solutions (orange)
    - 1-point calibration: Standard solution to connector S1
    - 2-point calibration:
      - low standard solution to connector S1,
      - higher standard solution to connector S2
  - 1 - 2 reagent solutions (green)
- 30 For each ChemBag, enter the use-by date on the display.
- 31 Carefully clamp the tubes into the tube holder.



The Alyza IQ has an extra counter for each ChemBag (see section 1.3.3 ChemBags, 17).  
When delivered, the counters are set to 100 %.

### Terminating the maintenance routine

- 32 Prepare the Alyza IQ for measurement again.

- 33 Carry out the *Fill the system* function after the maintenance activities are finished. All tubes of the MultiPort valve are automatically filled with the connected solutions and sample liquid.
- 34 Close the Alyza IQ.
- 35 Optional (as necessary):  
Carry out the *Purge manually* function to rinse the measuring cycle with cleaning solution.
- 36 Complete the maintenance routine (see section 5.4 Carrying out maintenance- and cleaning activities of the liquid circle of the Alyza IQ,  102) at the terminal.

## 5.6 Maintenance- and cleaning activities of the sample filtration and sample feed



The steps for the cleaning of the filter module are given in the operating manual of the filter module (FM/PC).

### 5.6.1 Mechanical cleaning of the filter plate

The time when to clean the filter plate can be determined empirically based on the negative pressure display on the filtration pump.

- A pulsing negative pressure manometer suggests a normal operating condition of the filtration unit
- With a delivery height of approx. 2 m and a new filter plate, the negative pressure is approx. -0.3 bar.  
Every meter of delivery height increases the negative pressure by approx. -0.1 bar.  
If the negative pressure increases by a further -0.3 ... -0.4 bar with time, the filter plate is covered with solid matter from the sample and has to be cleaned.
- If there is still negative pressure after the mechanical cleaning:  
Chemical cleaning is required, or the intake line may be blocked.

#### **NOTE**

*Dirt particles and contamination in the sample line can block the valves of the measuring unit.*

*During the cleaning activities, make sure that no dirt particles get into the open tube ends or the connector of the filter module.*

*Protect the open tubes and connectors during the cleaning activities, e.g. with blind plugs.*

- Maintenance interval** 2 to 4 months, depending on the application
- Preparations**
- 1 Stop the Alyza IQ and activate the maintenance condition at the IQ SENSORNET.
  - 2 Switch off the filtration pump with the Stop key.
  - 3 Pull the filtration unit out of the basin or channel.
    - The filter module does not have to be separated from the guide slide.
    - Do not unplug the sample line.
    - Do not dismount the filter plate from the frame.
  - 4 Clean the filtration unit.
  - 5 Clean the frame.
  - 6 Rinse off of the filter module any gross contamination with low water pressure (e.g. with a watering can or wash bottle).
  - 7 Then carefully remove the coating from the filter plate using a soft special brush. Normally the brownish coating can well be seen coming off while the lighter surface of the filter plate is appearing.

**NOTE**

*The filter plate is easily damaged. Never touch the filter plate with sharp-edged objects or place any objects on it.*

*Pressure on the filter plate may only be applied from the outside. No counter-pressure may build up through the suction line.*

*Do not press the special brush onto the surface of the filter plate too firmly and do not change the moving direction of the brush (do not scrub!).*



If the contamination cannot be removed with the mechanical cleaning, carry out the chemical cleaning (see section 5.6.2 Chemical cleaning of the filter plate, 113).

- 8 After cleaning, check both sides of the filter plate for damage.
- 9 Thoroughly clean the special brush under running water, dry it and store in a dust free place till the next use.
- 10 Remount and secure the cleaned filter module on the slide.
- 11 Submerge the filtration unit in the basin or channel.
- 12 Switch on the filtration pump with the Start key.



**Restarting the measuring operation**

- 13 Restart the Alyza IQ and switch off the maintenance condition at the IQ SENSORNET.

**5.6.2 Chemical cleaning of the filter plate**

Chemical cleaning is recommended if mechanical cleaning no longer achieves any significant improvement, i.e. the negative pressure on the manometer no longer decreases significantly after mechanical cleaning.

In this case, the filter plate is blocked. The blockage is mostly organic and can only be removed by chemical cleaning.

The chemical cleaning is carried out with the aid of a suitable container (Filter-CL) for the cleaning bath. The amount of cleaning solution required depends on the shape and size of the cleaning container.

**Cleaning solution**

In most cases, organic blockages can easily be removed with an aqueous sodium hypochlorite solution (chlorine bleaching agent, NaClO, 1 % active chlorine). In some cases, NaOH 4 % (sodium hydroxide) has proven effective.

In the event of calcification, diluted hydrochloric acid (HCl) is recommended (0.01 mol/l HCl, 0.036%, pH 2).

**Preparing the cleaning solution**

The cleaning solution can be made from different detergent concentrates by diluting with water. A selection of possible detergent concentrates is given in the section 5.2 Replacement parts, accessories, 98.

Prepare the cleaning solution according to the following table. It can be mixed in the cleaning container.

Base solution	Preparation instructions	Yield
Household hygienic cleaner based on sodium hypochlorite	Add so much water to 1.5 l hygienic cleaner that the volume is 6 l	6 l
Techn. sodium hypochlorite solution (13 % active chlorine)	Add so much water to 300 ml solution that the volume is 5 l	5 l

**WARNING**



**Dangerous chemicals.**

**Improper use of chemicals can cause damage to your health.**

**Heed the following rules:**

- **Read the labels of the chemicals containers and follow the safety instructions**
- **Wear protective equipment (lab coat, protective goggles, chemical resistant protective gloves)**

**Pre-cleaning**

- 1 Prior to each chemical cleaning, pre-clean the membrane with the special brush and rinse it with water. See section 5.6.1 Mechanical cleaning of the filter plate,  111.
- 2 Dismount the filter unit from the slide.
- 3 Dismount the intake line from the filter unit.
- 4 Protect the filter plate against any contamination coming in (e.g. by closing the connection adapter for the intake line).
- 5 Dismount the filter plate (see section 5.6.4 Replacing the filter plate of the sample filtration,  115).
- 6 Close the connector of the filter unit and the open intake line with blind plugs to that no contamination can get into the filter.



The chemical cleaning of the filter plate may take some time. Use a replacement filter module (FM/PC) during the cleaning process to keep the downtime of the Alyza IQ as short as possible.



**Chemical cleaning**

- 7 Completely submerge the filter module with the installed filter plate in the cleaning container filled with the cleaning solution.
  - Start with a reaction time of 30 minutes.
  - Watch the cleaning success and extend the reaction time as necessary.
- 8 After the chemical cleaning, rinse the filter module with clean water.



Even a filter plate that is supposedly irreversibly blocked may be restored by leaving it in the cleaning solution for a longer period of time and then rinsing it several times.

**Restarting operation**

- 9 After cleaning, check both sides of the filter plate for damage.
- 10 Remount the filter plate (see section 5.6.4 Replacing the filter plate of the sample filtration,  115).  
or  
Store the cleaned filter plate (see section 5.6.3 Storing a used and cleaned filter plate,  115).

### 5.6.3 Storing a used and cleaned filter plate

Proceed as follows to store the filter plate:

- 1 Clean the filter plate mechanically.
- 2 Clean the filter plate chemically.
- 3 Rinse the filter plate under flowing tap water.
- 4 To protect it against drying out, store the filter plate in the Filter-CL cleaning container or in a sealed plastic bag.



Prior to each use, soak the filter plate in tap water.  
If the filter plate has dried out, soak it in tap water for several hours.

### 5.6.4 Replacing the filter plate of the sample filtration

#### **NOTE**

*The filter plate is easily damaged. Never touch the filter plate with sharp-edged objects or place any objects on it.*

#### **Maintenance interval**

#### **Dismounting the filter plate**



As necessary, if cleaning does not help.

Proceed as follows to exchange the filter plate:

- 1 Stop the Alyza IQ and activate the maintenance condition at the IQ SENSORNET.
- 2 Switch off the filtration pump with the Stop key.
- 3 Pull the filtration unit out of the basin or channel.
  - Do not separate the filter module from the guide slide.
  - Do not dismount the filter plate from the frame.
- 4 Clean the filtration unit.
- 5 Dismount the filter module from the guide slide.
- 6 Unscrew the V4A countersunk screws of the frame (12 hexagon sockets).
- 7 Remove the used filter plate.
- 8 Clean the frame.



Cleaning of the filter plate, see

- section 5.6.1 Mechanical cleaning of the filter plate,  111
- section 5.6.2 Chemical cleaning of the filter plate,  113

**Remounting the filter plate**


- 9 Insert a new filter plate in the lower frame part.
- 10 Place the upper frame part onto the lower frame part with the built-in filter plate.
- 11 Insert the V4A countersunk screws and tighten them by hand. The fixing ring and lower part of the housing must be pressed together and flush (without gap).
- 12 Remount and secure the cleaned filter module on the slide.
- 13 Submerge the filtration unit in the basin or channel.
- 14 Switch on the filtration pump with the Start key.

**Restarting the measuring operation**

- 15 Restart the Alyza IQ and switch off the maintenance condition at the IQ SENSORNET.

**5.6.5 Cleaning the sample feed and overflow vessel**

The intake line takes the sample liquid from the filter module to the filtration pump. The sample feed tube goes from the filtration pump to the overflow vessel. From time to time it can be required to clean the intake line, sample feed tube and overflow vessel.

Abb. 5-8,  116 shows the intake line (blue, ID 2mm; OD 4 mm) in the Alyza IQ.

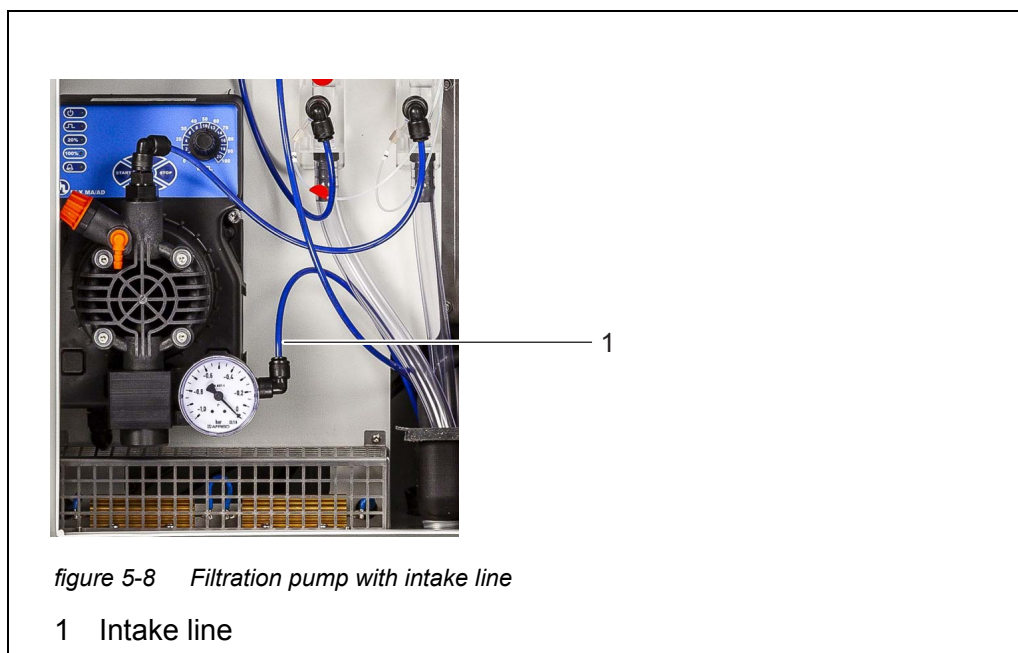

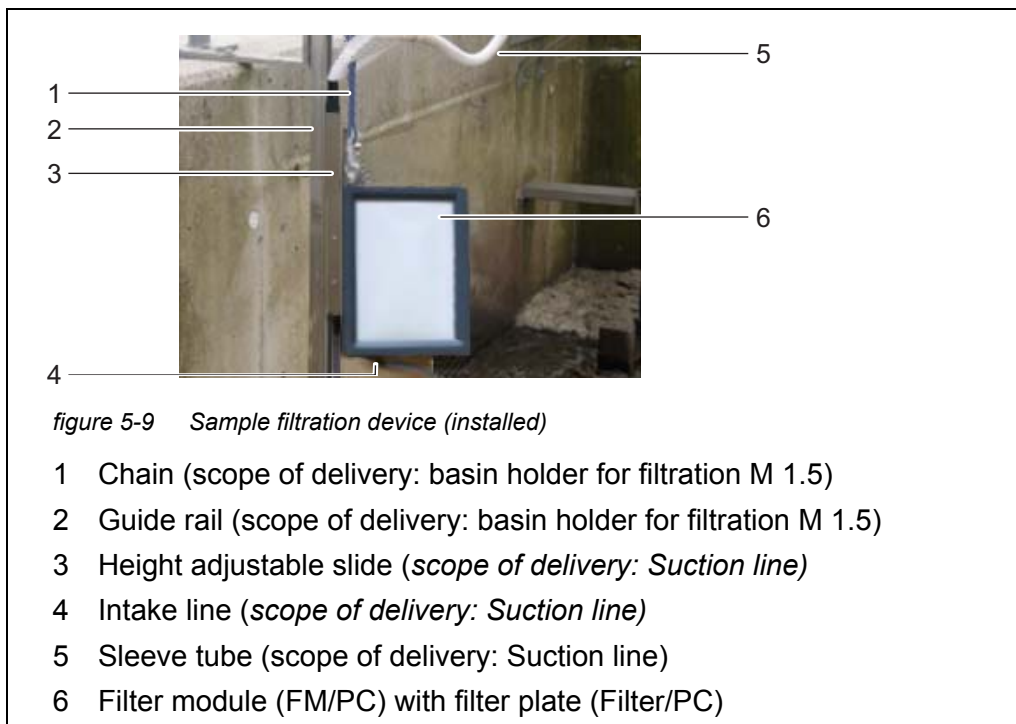


Abb. 5-9,  117 shows the intake line on a mounted filter module in a sedimentation tank.

**WARNING**

**Dangerous chemicals.**

**Improper use of chemicals can cause damage to your health.**

**Heed the following rules:**

- **Read the labels of the chemicals containers and follow the safety instructions**
- **Wear protective equipment (lab coat, protective goggles, chemical resistant protective gloves)**

**Maintenance interval Preparations**

As required.

Proceed as follows to clean the intake line:

- 1 Stop the Alyza IQ and activate the maintenance condition at the IQ SENSORNET.
- 2 Switch off the filtration pump with the Stop key.
- 3 Drain the intake line.
- 4 Keep ready a container to collect the contents of the overflow vessel.
- 5 Empty the sample tube (Alyza menu / tab *Maintenance / Maintenance functions of measuring unit / Draining (separately)*)
- 6 Unscrew the sample tube (connection to the measuring unit) from the overflow vessel.

- 7 Open the sample feed tube at the quick coupling on the overflow vessel and let the contents of the overflow vessel drain into the container.
- 8 Remove the overflow vessel from the Alyza IQ.

**Cleaning**

- 9 Open the lid of the overflow vessel.
- 10 Clean the overflow vessel and lid with a brush, water, descaler or detergent.  
Subsequently, thoroughly rinse the overflow vessel with water to remove any detergent residues.

**NOTE**

*Detergents containing alcohol will damage the overflow vessel.*

- 11 If necessary: exchange or clean the filter plate (see section 5.6.1 Mechanical cleaning of the filter plate, 111).
- 12 Disconnect the intake line from the filter module and put it in a container with cleaning solution (recommendation: see section 5.2 Replacement parts, accessories, 98).  
For the minimum quantity of cleaning solution for the different line lengths, see the following table:

Length of intake line	Minimum quantity of cleaning solution
5 m	≥ 30 ml
10 m	≥ 50 ml
20 m	≥ 100 ml

- 13 Insert the sample intake tube coming from the filtration pump in a bottle (≥ 0.5 l) or another suitable container and fix it.

**WARNING**

**Dangerous chemicals.**

**Wear protective equipment (lab coat, protective goggles, chemical resistant protective gloves)**

**Risk of splashing!**

**During operation, the filtration pump can develop considerable pressure. Therefore, absolutely heed the following instructions:**

- **Fix the sample intake tube so that the pressure surges of the filtration pump will not make it come out of the bottle.**
- **Cover the bottle so that no cleaning solution can splash out due to the pressure surges.**
- **Bring the bottle into a stable position and fix it if necessary.**
- **If necessary, test the arrangement with tap water first.**

- 14 Switch on the filtration pump with the Start key.  
Cleaning solution is drawn in through the intake line until it flows into the bottle at the open line end. Leave the filtration pump switched on until the minimum quantity (see table point 7) has been drawn in from the container with cleaning solution.  
If necessary, increase the percent setting for the pump performance at the filtration pump.
- 15 Switch off the filtration pump with the Stop key; allow the cleaning solution to take effect (altogether approx. 10 min). During this time, occasionally start/stop the filtration pump so the cleaning solution in the intake line is moved towards the bottle.
- 16 When doing so, check the filling level of the bottle to keep the solution from overflowing. If necessary, empty the bottle (dispose of the cleaning solution properly).
- 17 Switch off the filtration pump with the Stop key.
- 18 Reconnect the intake line to the filter module and reinstall the filter module in the sample.
- 19 Switch on the filtration pump with the Start key and let it pump for some time (at least 5 - 10 min, depending on the length of the intake line) with approx. 60% capacity to completely remove all the cleaning solution from the filter plate and intake line. This can normally be recognized by the clear sample liquid that comes out of the line. If necessary, set the percent setting for the pump capacity to the previous value.
- 20 Switch off the filtration pump with the Stop key.
- 21 Reinstall the overflow vessel in the Alyza IQ.

- 22 Screw the sample feed tube to the overflow vessel.
- 23 Reconnect the sample tube of the MultiPort valve in the measuring unit with the quick coupling of the overflow vessel.
- 24 Remove the container that held the cleaning solution. Dispose of the cleaning solution in the bottle properly at the overflow vessel.
  
- 25 Switch on the filtration pump with the Start key.
- 26 Leave the filtration pump to work for some time to completely remove the detergents.
- 27 Fill the sample tube (Alyza menu / tab Maintenance / Manual actions / Fill individually / Sample tube)
  
- 28 Restart the Alyza IQ and switch off the maintenance condition at the IQ SENSORNET.

**Restarting the measuring operation**

**5.7 Maintenance activities at the housing**

**5.7.1 Cleaning the housing of the Alyza IQ**

- Outside** Clean the outside of the housing with a brush, water and dish-washing solution.
- Inside** Clean the inside with a moist (not dripping) cloth, water and dish-washing solution.

**5.7.2 Changing the filter mats**

The filter mats are in front of the ventilation grids (under the housing lid and on the underside of the housing).  
 The ventilators are behind the ventilation grids. The filter mats can thus be exchanged riskless even during operation.  
 Depending on contamination

**Maintenance interval  
 Upper filter mat**


- 1 Remove both front screws on the housing lid.
- 2 Open the housing lid upward and fix it with the bearer. See Abb. 5-10,  121.





figure 5-10 Opening the housing lid

- 1 Housing lid
- 2 Bearer
- 3 Fixing screw
- 4 Filter mat holder

- 3 Open the upper filter mat holder with the aid of a screwdriver by levering it off and exchange the upper filter mat. See Abb. 5-11, 121.

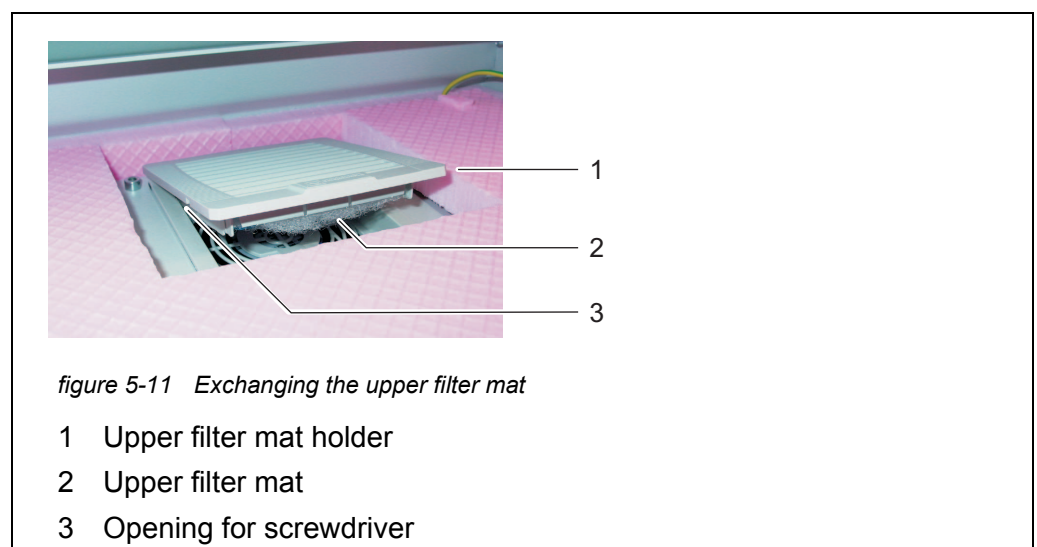


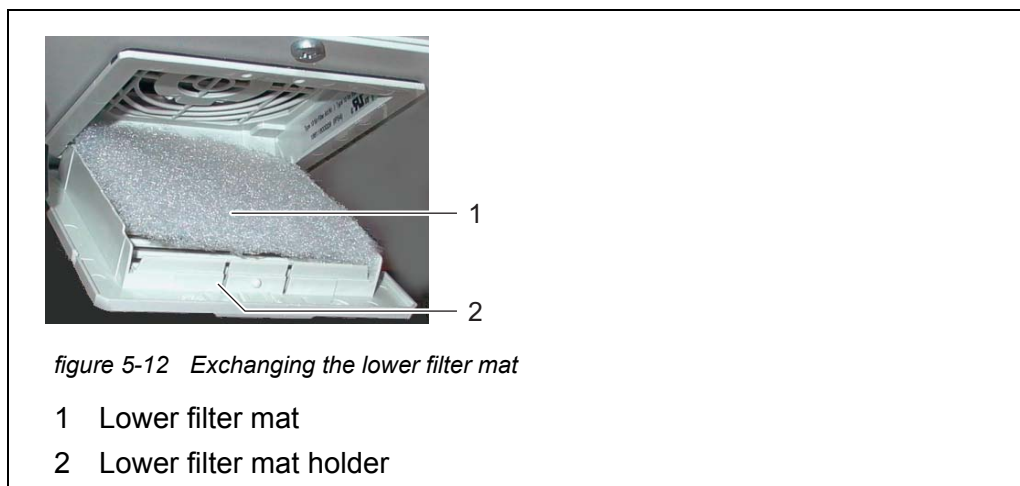
figure 5-11 Exchanging the upper filter mat

- 1 Upper filter mat holder
- 2 Upper filter mat
- 3 Opening for screwdriver

- 4 Press the upper filter mat holder shut again.
- 5 Fold the bearer and close the housing lid.
- 6 Screw the housing lid tight with the two screws.

**Lower filter mat**

- 7 Position yourself under the Alyza IQ housing.
- 8 Open the lower filter mat holder and exchange the filter mat as done with the upper filter mat holder.



- 9 Close the lower filter mat holder again.

**5.7.3 Checking the temperature control**

For correct measured values, it is required to control the temperature of some areas of the Alyza IQ.

The Alyza IQ has 3 areas that are temperature-controlled differently:

Range	Temperature control
Housing inside	+5 ... +40 °C
Measuring unit	20°C
Photometer unit	45°C

Heating units, cooling units and ventilators are used to control the temperature of the areas.

The correct temperature control is continuously and automatically monitored for each area in the Alyza IQ.


If an area of the Alyza IQ is not within the specified range, a message appears in the log book. If the deviation from the specified range is great, the Alyza IQ is automatically stopped. The error is documented by an error message in the log book.

You can check very easily and at any time the current status of the temperature control in the Alyza menu / tab *Info*. All temperatures (outside temperature, temperature inside the housing, temperature within the measuring unit) and the op-

erating condition of the ventilators, heating and cooling unit are documented.

### Checking the temperature control manually


If you suspect the temperature control to be erroneous, you can also check the functioning of the housing ventilators, heating, and cooling manually:  
It is not possible to check the temperature control of the measuring unit and photometer unit manually.

- 1 Check the logbook of the Alyza IQ for temperatures exceeding or undercutting the operating temperatures (section 8.1.1 Error messages,  144).
- 2 Check the operating temperatures in the *Info* tab of the Alyza IQ.  
If you suspect the temperature control of being defective, you can also manually check the individual areas while the Alyza IQ is open (see the following steps).

### Checking the cooling

- 3 At outside temperatures of  $> +25$  °C, check that the ceiling fan is running:  
Open the housing lid.  
Hold a hand to the upper ventilation grid.  
Feel the air current.



The air currents can be felt better with damp hands.  
With a (very) weak air current:  
Check the permeability of the filter mats (section 5.7.2 Changing the filter mats,  120).



## 5.8 Maintenance activities at the power supply box



### WARNING


If the power supply is connected incorrectly, there may be danger to life from electric shock.

Pay attention to the following points during installation:

- The power supply box may only be connected to the power supply by a qualified electrician.
- The power supply box may only be connected to the power supply when it is not carrying any voltage.
- The power supply must fulfill the specifications given on the nameplate and in chapter 7 Technical data,  137.
- The power supply of the heat tracing must fulfill the specifications given on the heat tracing (240 VAC or 120 VAC).
- To operate a heat tracing line, a fault current protection switch (ground fault circuit interrupter) has to be installed.
- The power cable must meet the requirements according to the technical data (see section 7.4 Electrical data,  142).



For all work done with the housing open:

- If the Alyza IQ was already in operation:  
Before opening the doors, start the maintenance routine at the terminal.
- Note the environmental conditions (see section 3.3.1 Requirements of the measurement location,  28).
- Open the outer housing door far enough so the arrestable brake-stay (on the lower right side of the housing) catches.
- Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.

- 1 Open the outer housing door far enough so the arrestable brake-stay (on the lower right side of the housing) catches.
- 2 Open the inner housing door far enough so that it touches the outer door. Tilt the angular sheet (at the inside of the outer door) over the upper edge of the inside door.

### Switching off the power supply

- 3 Switch off all filtration pumps (STOP).
- 4 Switch off the 24 V power supply.

**Removing the mounting plate**

5 Switch the power line potential free.

6 Unscrew the 2 fixing screws of the cover (on the top right side in the housing) and remove the cover of the ACM.



If the filtration pumps have already been in operation, sample liquid may escape when the tubes are unscrewed. Provide a collecting container in such a case.

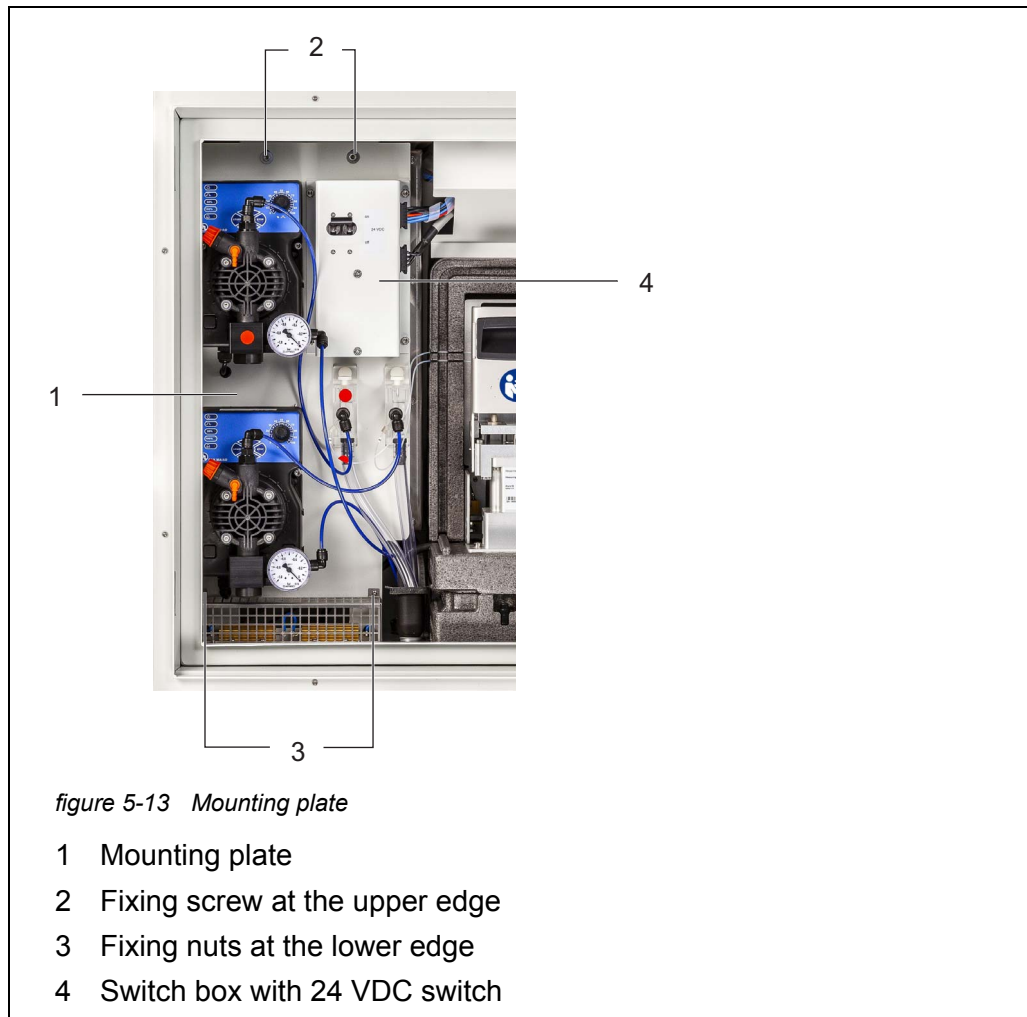
7 Remove the cable connections and the connections of the liquid lines from the mounting plate:

- Unplug the 2 cables from the switch box.
- Unscrew the tubes from the overflow vessels to the measuring unit.
- Unplug the blue suction lines of the intake tubes of the filtration unit.

8 Remove the mounting plate:

- Unscrew the 2 fixing nuts (3) at the bottom of the mounting plate.
- Unscrew the 2 fixing screws (2) at the upper edge of the mounting plate.

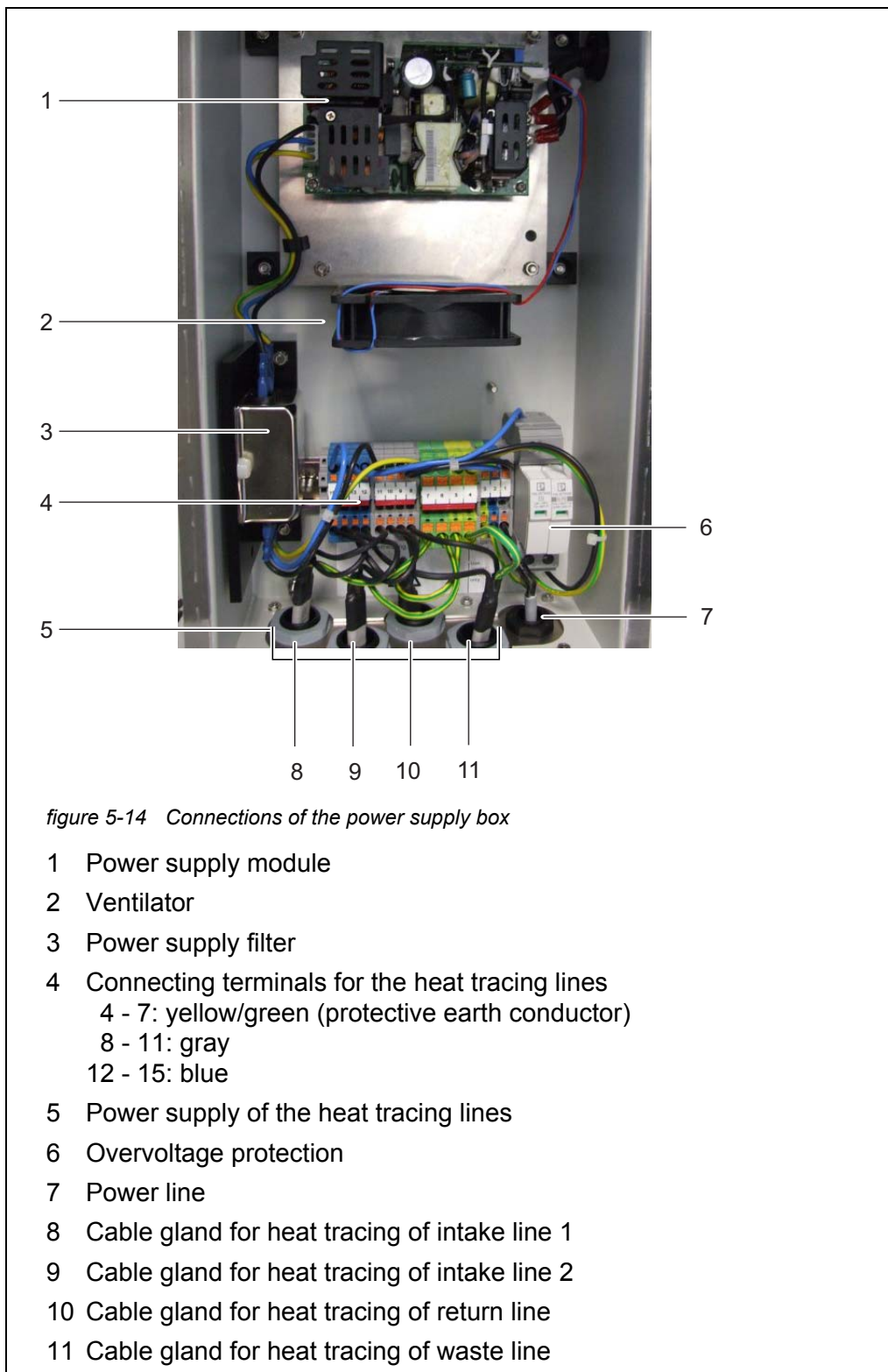
Secure the mounting plate against falling out.



- 9 Remove the mounting plate:
  - Lift the mounting plate upward over the threaded pins.
  - Tilt the upper edge of the mounting plate somewhat backwards and remove the mounting plate from the housing downwards.
  - Place the mounting plate with the rear side down on a protected surface (e.g. with cardboard).


### Opening the power box

- 10 Unscrew all nuts with safety disks (10 pieces) from the power supply box and remove the lid of the power supply box.



11 Carry out the maintenance activities at the power supply box.



Details on connecting the heat tracing and power cable:  
see section 3.3.16 Connecting the power cable, heat tracing lines,  
and tubes,  56

- 12 Check whether all connections are made correctly.
- 13 Tighten the cable glands on the power supply box with a torque of 2.5 Nm.  
The cable glands protect the power supply box from dust and moisture.



Make sure that no cable touches the power supply filter.

#### Closing the power supply box

- 14 Remount the lid of the power supply box and screw tight all nuts with safety disks as far as they will go (0.4 Nm).  
The power supply box is closed and protected against dust and moisture.

#### Reinserting the mounting plate

- 15 Insert the mounting plate:
  - Plug the mounting plate on the threaded pins inside the housing.
  - Tighten the 2 fixing screws (2) at the upper edge of the mounting plate.
  - Tighten the 2 fixing nuts (3) at the bottom of the mounting plate.
- 16 Re-establish the cable connections and the connection of the liquid lines.
  - Plug the sample feed tubes onto the connectors of the filtration pumps.
  - Screw the tubes to the measuring unit onto the connectors of the overflow vessels.
  - Connect the 2 cables to the switch box.
- 17 Reinsert the cover and fix it with the 2 fixing screws.

#### Restoring the power supply

- 18 Switch on the mains power supply.
- 19 Switch on the 24 V power supply.
- 20 Switch on all filtration pumps (START).



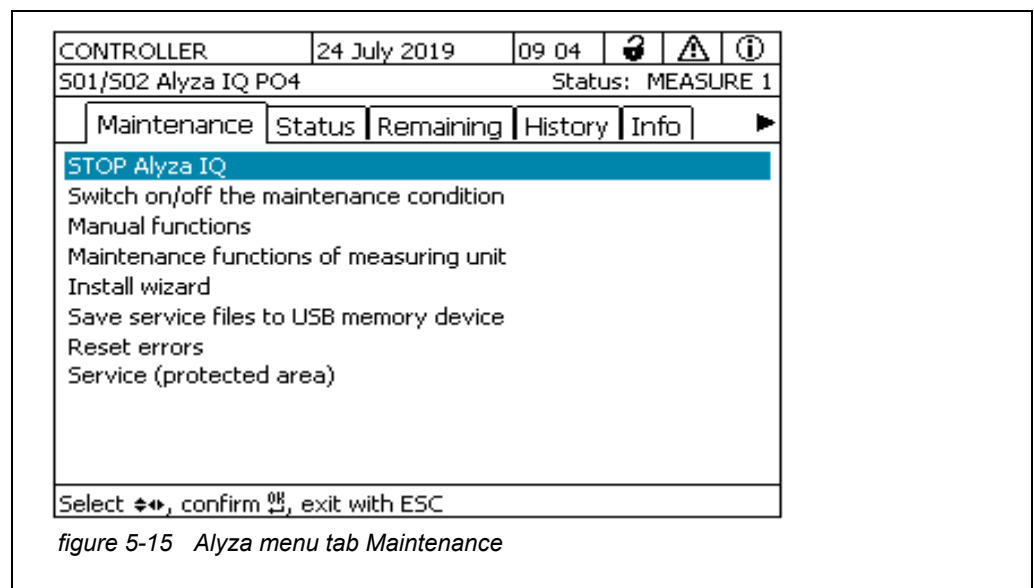
### Restarting the measuring operation

- 21 Complete the maintenance routine (see section 5.4 Carrying out maintenance- and cleaning activities of the liquid circle of the Alyza IQ, 102).

## 5.9 Commissioning steps at the IQ SENSORNET terminal

The following steps are carried out at a terminal in the IQ SENSORNET system. Instructions on operation are given in the respective IQ SENSORNET system operating manual.

- 1 In the measured value display, use <▲▼> to select the Alyza IQ.
- 2 Using the <C> key, switch to the Alyza menu.
- 3 Using <◀>, switch to the *Maintenance* tab.



- 4 Open the *Manual functions* menu.
- 5 If the system was drained previously:  
Carry out the *Fill the system* function.  
All tubes of the Alyza IQ are automatically filled with the connected solutions and sample liquid.
- 6 Using <ESC>, quit the menu *Manual functions*.
- 7 Follow the instructions on the display.

**Starting the measurement**

- 8 Carry out the *START Alyza IQ* function.  
The measured value determination takes approx. 5...7 minutes.  
A note is displayed.



If the measurement is delayed because a function with higher priority (e.g. automatic cleaning or calibration) is carried out before, this is indicated by a message such as WAIT CLEAN.

- 9 Confirm the note with **<OK>**.  
The measured value display appears. While no valid measured value is available, the display shows bars «- - -».
- 10 Wait until a measured value is shown in the measured value display (approx. 5...7 minutes).

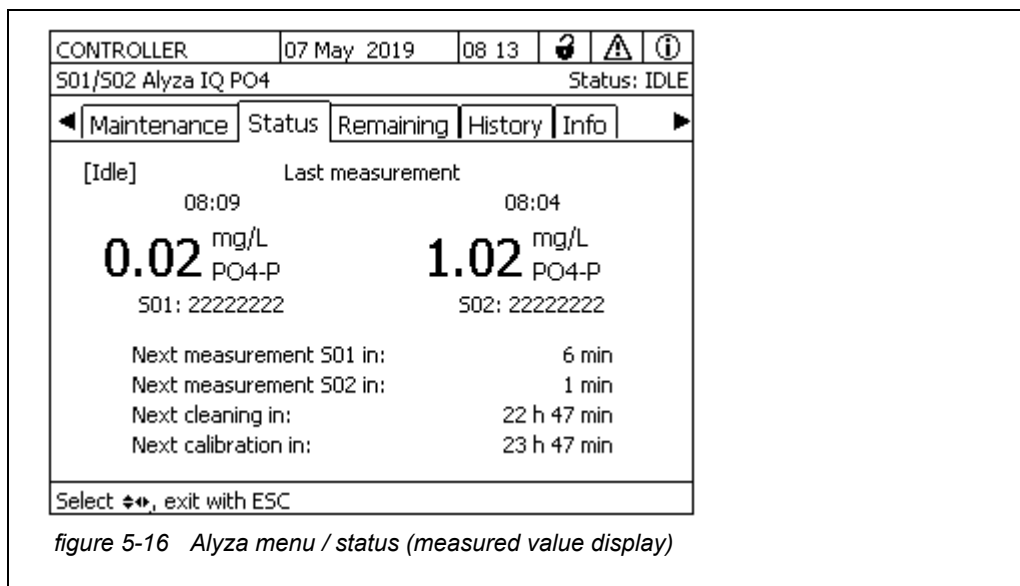


figure 5-16 Alyza menu / status (measured value display)

- 11 Switch off the maintenance condition.



After the initial commissioning, the Alyza IQ works with the factory settings. If the measured values are not as expected, further actions and correction settings are available:

- Cleaning (in the Alyza menu / tab *Maintenance / Manual functions*)
- Calibration (see section 4.4 Calibration, 82)
- Offset correction

## 6 What to do if ...

Display “----”



Information on the cause of the indication is in the log book and in the Alyza menu / tab *Status*.

Cause	Remedy
No (valid) measured value available	Start measurement and wait for the measurement to be finished (5 .. 7 min)
Three erroneous automatic calibrations in succession	<ul style="list-style-type: none"> <li>● Check the calibration standards (e.g. expiry date)</li> <li>● Check the connection of the calibration standards (for 1-point calibration, the ChemBag at connector 'S1' is always used.)</li> <li>● Refill the tubes for the ChemBags with standard solutions <i>Alyza menu / tab Maintenance/Manual functions/Filling (separately)</i></li> <li>● Perform cleaning <i>Alyza menu / tab Maintenance/Manual functions/Clean</i></li> <li>● Exchange calibration standards</li> <li>● Contact the service department</li> </ul>
<p><i>Status ERROR</i> The Alyza IQ has stopped due to an error</p> <p>General proceeding</p>	<ul style="list-style-type: none"> <li>● View the error in detail e.g. in the Alyza menu / tab <i>Status</i> (show details with &lt;OK&gt;) or view log book message</li> <li>● Remedy the error</li> <li>● <i>START Alyza IQ</i></li> <li>● If the <i>Status ERROR</i> is still there:                             <ul style="list-style-type: none"> <li>– Reset the error: <i>Alyza menu / tab Maintenance/Manual functions/Reset errors</i></li> <li>– <i>START Alyza IQ</i></li> </ul> </li> <li>● Contact the service department</li> </ul>

Cause	Remedy
<p><i>Status ERROR</i> The liquids from one or several ChemBags are not transported to the MultiPort valve</p>	<ul style="list-style-type: none"> <li>● View the log book message</li> <li>● Check the filling level of the Chem-Bags</li> <li>● Check the connection of the tubes</li> <li>● Empty the tube and refill it <i>Alyza menu / tab Maintenance/Manual functions/Drain and Fill</i></li> </ul>
<p><i>Status ERROR</i> Sample intake does not work</p>	<ul style="list-style-type: none"> <li>● Check the filtration pump</li> <li>● Switch on the filtration pump</li> <li>● Clean the overflow vessel and intake line</li> </ul>
<p><i>Status ERROR</i> The temperature in the measuring unit or photometer unit Alyza IQ is outside the allowed range (e.g. due to the air circulation in the Alyza IQ being impeded)</p>	<p>Measuring (automatically or manually) is only possible if the operating temperature in both the measuring unit and photometer unit is in the allowed range.</p> <ul style="list-style-type: none"> <li>● Check for contamination and, if necessary, exchange the filter mats at the housing (see section 5.7.2, 120)</li> <li>● Check for contamination and, if necessary, clean the bug screen</li> <li>● Check for contamination and, if necessary, clean the condensate drain adapter</li> </ul>
<p><i>Status ERROR</i> Danger of condensation water forming in the measuring unit</p>	<ul style="list-style-type: none"> <li>● View the error in detail e.g. in the Alyza menu / tab <i>Status</i> (show details with &lt;OK&gt;) or view log book message</li> <li>● Start the dehumidifying program for the measuring unit <i>Alyza menu / tab Maintenance/Maintenance functions of measuring unit/ Dry the measuring unit</i></li> <li>● <i>START Alyza IQ</i></li> </ul>
<p>Power failure</p>	<ul style="list-style-type: none"> <li>● In the Alyza menu (tab <i>Maintenance</i>), start the Alyza IQ.</li> <li>● If necessary, activate the function "Automatic start after power failure"</li> </ul>
<p>Unknown</p>	<p>See log book or Alyza menu / tab <i>Status</i> (show details with &lt;OK&gt;)</p>

## Display of OFL

Cause	Remedy
Measuring range exceeded	Select different measuring range
Calibration error	<ul style="list-style-type: none"> <li>● Check the calibration standards (e.g. expiry date)</li> <li>● Check the connection of the calibration standards (for 1-point calibration, the ChemBag at connector S1 is always used.)</li> <li>● Refill the tubes for the ChemBags with standard solutions <i>Alyza menu / tab Maintenance/Manual functions/Filling (separately)</i></li> <li>● Perform cleaning <i>Alyza menu / tab Maintenance/Manual functions/Clean</i></li> <li>● Exchange calibration standards</li> <li>● Contact the service department</li> </ul>
Measuring cell of the photometer unit dirty	<ul style="list-style-type: none"> <li>● Cleaning <i>Alyza menu / tab Maintenance/Manual functions/Clean</i></li> <li>● Contact the service department</li> </ul>

## Display of ERROR

Cause	Remedy
Alyza IQ is not properly connected	Check the assignment of the terminal connections
Communication between Alyza IQ and IQ SENSORNET is interrupted	Check the cable and connections
The electrical power supply of the Alyza IQ is interrupted	<ul style="list-style-type: none"> <li>● Check the power supply</li> <li>● Check the maximum load</li> </ul>

**Implausible  
measured values**

Cause	Remedy
Erroneous measurement	Wait for another measurement
Calibration error	<ul style="list-style-type: none"> <li>● Repeat calibration</li> <li>● Check the calibration standards</li> <li>● Check the connection of the calibration standards (for 1-point calibration, the ChemBag at connector S1 is always used.)</li> <li>● Refill the tubes for the ChemBags with standard solutions <i>Alyza menu / tab Maintenance/Manual functions/Filling (separately)</i></li> <li>● Exchange calibration standards</li> <li>● Increase the time between cleaning and calibration.</li> </ul>
Measured values always too high after cleaning	<p>Activate the function <i>Conditioning</i> (menu <i>Settings of sensors and diff. sensors/Autom.cleaning</i>).</p> <p>After cleaning, a rinse is carried out for each of the set number of steps and then a rinse with the sample and the added reagent.</p>

Cause	Remedy
Measuring cell of the photometer unit dirty	<ul style="list-style-type: none"> <li>● Perform cleaning Alyza menu / tab <i>Maintenance/Manual functions/Clean</i>)</li> <li>● Contact the service department</li> </ul>
Interferences e.g. in sample matrix	<ul style="list-style-type: none"> <li>● Activate the function <i>Backgr. corr. (opt)</i>. PLEASE NOTE: For the optimized background correction, an extra tube and an extra ChemBag have to be installed (see section 5 Maintenance and cleaning, 95).</li> <li>● Select suitable measuring location</li> </ul>
Photometer unit draws air (e.g. lack of sample in the overflow vessel)	<p>Make sure that there is enough sample in the overflow vessel, e.g.:</p> <ul style="list-style-type: none"> <li>● Maintain the filtration unit</li> <li>● Set the pump capacity in the range 10 - 100 %</li> <li>● De-aerate the pump (open the vent valve)</li> </ul>

**Measuring mode cannot be set**

Cause	Remedy
Alyza IQ is not stopped	Stop the Alyza IQ

**Red signal LED at the measuring unit**

Cause	Remedy
LED lights up red. Error causing the STOP of the Alyza IQ	Check and, if necessary, eliminate the error message in the log book
LED flashes red A beep is to be heard.	<p>There is risk of damage due to the formation of condensation water within the measuring unit. Close the measuring unit immediately. After being open for 3 minutes, the measuring unit is automatically separated from the power supply to avoid damage due to a short-circuit on the PCB.</p> <p>To open the measuring unit for maintenance activities:</p> <ul style="list-style-type: none"><li>● Before, start the function <i>Prepare to open measuring unit</i>.</li><li>● Wait until the opening of the measuring unit is released</li></ul>



## 7 Technical data

### 7.1 Measurement characteristics *PO4-P*, *PO4*

**Measuring method** Vanadate molybdate method (yellow method) in combination with an LED photometer

**Measuring ranges and resolution**

Measuring range	Measuring mode (citation form)	Measuring ranges	Resolution	Accuracy
1	<i>PO4-P</i>	0.02 ... 15.00 mg/L 0.02 ... 15.00 ppm 0.6 ... 480.0 umol/L	0.01 0.01 0.1	±2 % , ±0.02 ±2 % , ±0.02 ±2 % , ±0.6
	<i>PO4</i>	0.06 ... 46.00 mg/L 0.06 ... 46.00 ppm 0.6 ... 480.0 umol/L	0.01 0.01 0.1	±2 % , ±0.06 ±2 % , ±0.06 ±2 % , ±0.6
2	<i>PO4-P</i>	0.2 ... 50.0 mg/L 0.2 ... 50.0 ppm 6 ... 1600 umol/L	0.05 0.05 1	±2 % , ±0.2 ±2 % , ±0.2 ±2 % , ±6
	<i>PO4</i>	0.6 ... 153.0 mg/L 0.6 ... 153.0 ppm 6 ... 1600 umol/L	0.05 0.05 1	±2 % , ±0.6 ±2 % , ±0.6 ±2 % , ±6

All specifications concerning the measuring accuracy refer to the use of suitable standard solutions.

**Response time t90** < 5min

**Process variation coefficient** < ±2%

**Detection limit (measuring range 1)** ≤ 0.02 mg/L *PO4-P*

**Detection limit (measuring range 2)** ≤ 0.05 mg/L *PO4-P*

## 7.2 Application conditions

### Suitability and areas of application

The Alyza IQ analyzer is designed for online measurements of the orthophosphate concentration (PO<sub>4</sub>) in aqueous samples (e.g. in the outlets of waste water treatment plants), and to control and regulate the elimination of phosphorus in waste water treatment plants.

### Requirements of the test sample (photometer unit)

Temperature	+4 ... +45 °C
pH value	5...9
Solids contents	0 (max. particle size: 0.45 µm)
Bacteria	0 (as far as possible, free from bacteria)
Air bubbles	0
Required flow rate	Volume surge of the sample in the overflow vessel: < 1 ml/surge or, with continuous supply: Volume flow of the sample in the overflow vessel: 1 ... 25 ml/min



The requirements of the test sample are met by using the FM(PC) filtration system available as an accessory.

Using the FM(PC) filtration system is possible if the test sample meets the following requirements.

### Requirements of the test sample (filtration system)

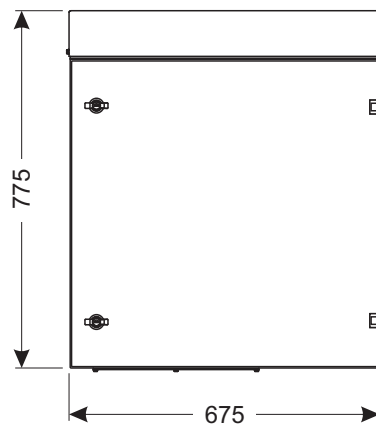
Temperature	+4 ... +45 °C
pH value	5...9
Solids contents	< 6 g/l

7.3 General data

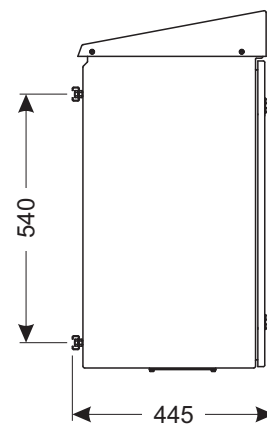
Dimensions and weight

Component	Height x width x depth	Weight (without chemicals)
Housing with components	825 x 686 x 438 mm	up to approx. 37 kg (depending on equipment)

Front view:



Lateral view:



Required space

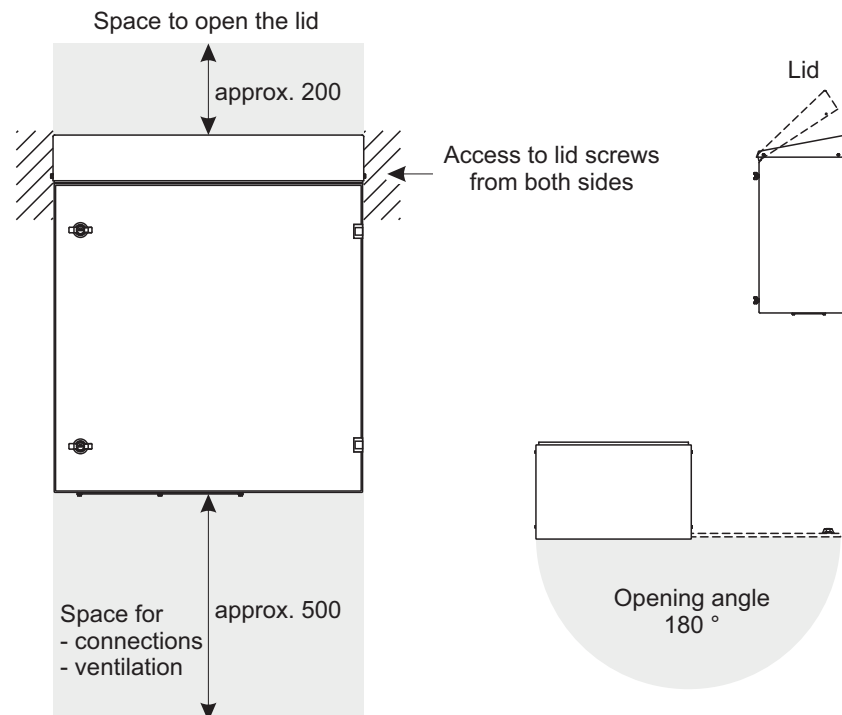


figure 7-1 Dimension drawing of Alyza IQhousing (dimensions in mm)

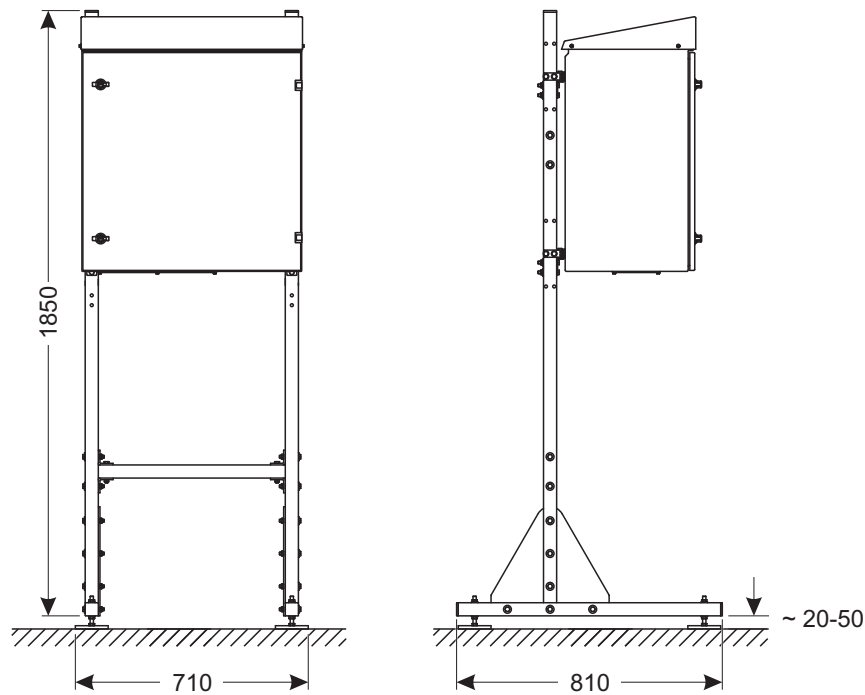


figure 7-2 Dimension drawing of Alyza IQ, installation on a mounting stand (dimensions in mm)

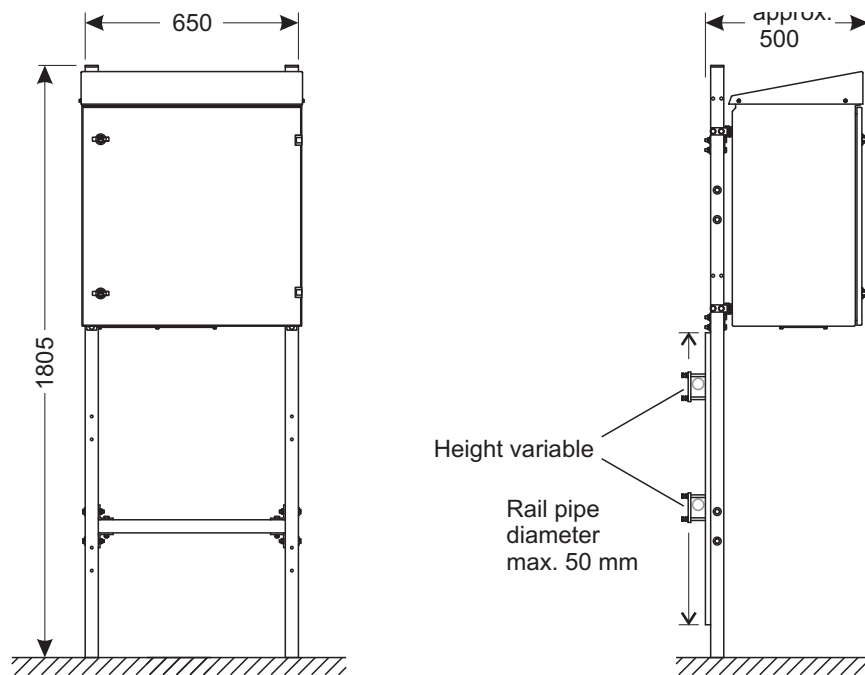


figure 7-3 Dimension drawing of Alyza IQ, rail mounting (dimensions in mm)

**Connection technique**

Connection to the IQ SENSORNET with the IQ SENSORNET cable

**Ambient conditions**

Temperature range	
● Mounting/installation/maintenance	+ 5 ... + 40 °C (+ 41 ... +104 °F)
● Operation	- 20 ... + 40 °C (- 4 ... + 104 °F)
● Storage	- 20 ... + 50 °C (- 4 ... + 122 °F) (in completely empty condition)
Relative air moisture	Max. 95 % (noncondensing)
● Mounting/installation/maintenance	≤ 80 %
● Yearly average	≤ 90 %
● Dew formation	Possible
Measuring location	Indoors and outdoors
● Site altitude	Max. 4000 m above sea level
● Level of contamination	2
Chloride concentration	< 500 mg/l (no sea water)

**Components**

Housing	Sunlight (UV) resistant Material: powder-coated aluminium Mounting plate: PVC
Cable glands at the base plate	M40 x 1.5 (black, large): Clamping range 19 - 28 mm M20 x 1.5 (black, small): Clamping range 6.5 - 12 mm
Overflow vessel	Material: PMMA Required sample quantity: 1... 25 ml/min For correct measurements, enough sample must always be available in the overflow vessel.
Temperature control	Heating, cooling, ventilation
Light source for photometer	LED, 400 nm (violet)
MultiPort valve (MPV)	

**Accessories**

Mounting stand, wall mount and rail mount	Rails: Stainless steel V2A, Screws etc.: stainless steel V2A, V4A
Filtration unit	Membrane surface of the filter plate: 1300 cm <sup>2</sup> Cut-off limit: < 0.45 µm Max. operating temperature: 45 °C (113 °F) Max. suction height: 5 m pH value: 2... 11,5 Housing: PVC Sleeve tube: PVC-reinforced PCV tube, transparent, 24 x 3 mm Intake line: PE 4 x 1 mm Line length (intake- and outlet line): Max. 20 m

**Meter safety**

Applicable norms	EN 61010-1 UL 61010-1 CAN/CSA C22.2#61010-1
Electromagnetic compatibility	EN 61326-1, EN 61326-2-3, FCC 47 CFR Part 15
Type of protection (housing)	IP 54 (EN 60529)
Type of protection (internal power supply box)	IP 67 (EN 60529)
Protective class	I
Overvoltage category	II

**Test certificates** CE, cETLus

**7.4 Electrical data**

Input voltage	120 V / AC ±10% / 60 Hz
Fuse protection of the building	16 A with ground fault circuit interrupter
Line power connection	3-pin, N/L /PE
Line cross-section of line power connection	Europe: 1.5 ... 4.0 mm <sup>2</sup> USA: AWG 14 ... 12

Cable (requirements)	Europe: IEC 60332-1-2 USA, Canada: UL 2556 VW-1 Details: <ul style="list-style-type: none"> <li>● Temperature-resistant in a range of -20 °C...+80 °C,</li> <li>● Weather-resistant (year-round)</li> <li>● Watertight (cable sheath)</li> <li>● Copper wire</li> </ul>
Power consumption Alyza IQ <ul style="list-style-type: none"> <li>● Basic consumption</li> <li>● Heat tracing, intake line return line</li> </ul>	300 - 1600 W (depending on the length of the heat tracing)  300 W  16 W/m (max. 80 m heat tracing allowed)
IQ SENSORNET cable (SNCIQ, SNCIQ/UG, SACIQ)	<ul style="list-style-type: none"> <li>● Insulation <math>\geq</math> 500 V</li> <li>● Temperature-resistant in a range of -20 °C...+80 °C,</li> <li>● Weather-resistant (year-round)</li> <li>● Watertight (cable sheath)</li> </ul>
Power delivery	max. 10 W

## 7.5 Consumption data

The consumption of chemicals depends on the specified intervals and on the selected measuring range.

**Typical  
consumption  
values**

Solution	Sufficient for
Reagent solution R-PO4/1-1	Examples: <ul style="list-style-type: none"> <li>– Measuring interval 5 minutes: 3 months</li> <li>– Measuring interval 10 minutes: 6 months</li> </ul>
Cleaning solution PO4 C-PO4/1-1	6 months (daily cleaning)
Standard solution S-PO4/1- 0.0	6 months (daily calibration)

## 8 Lists

### 8.1 Explanation of the messages

This chapter contains a list of all message codes and the related message texts that can occur in the log book of the IQ SENSORNET system for the Alyza IQ analyzer.



Information on the contents and structure of the log book and the structure of the message code is given in the LOG BOOK chapter of the IQ SENSORNET system operating manual.

The last three digits of the message code form the component code. It identifies the component (active component) that caused the message: Some error messages contain an internal error code, starting with "#".

Module code	Component
3D1	Alyza IQ PO4, channel 1
3D2	Alyza IQ PO4, channel 2
552	MIQ/Alyza (Adapter ADA)

#### 8.1.1 Error messages

Message code	Message text
EAM3Dx	<i>Meas. range exceeded or undercut * Check process</i>
EC1552	<i>Automatic calibration error: Calibration standard could not be determined or is not suitable for current measurement range. Alyza IQ stopped! * eingestellten Messbereich überprüfen * eingesetzten Kalibrierstandard überprüfen</i>
ES13Dx	<i>Component hardware defective * Contact service</i>
ES2552	<i>Component hardware defective xxx * Contact service</i>
ES3552	<i>Danger due to condensation water forming in the measuring unit. The measuring unit is switched off. * Dry the measuring unit</i>
ES4552	<i>Error temperature control of the measuring unit. * Contact Service</i>



Message code	Message text
ES5552	<i>Communication failure with ACS * Check ACS connection</i>
ES6552	<i>Pressure on port X to high. * Check the liquid circle for erros and replace maintenance parts if necessary.</i>
EI13Dx EI1552	<i>Operational voltage too low * Check installation and cable lengths, Follow installation instructions * Power supply module(s) overloaded, add power supply module(s) * Check terminal and module connections * Defective components, replace components</i>
EI23Dx EI2552	<i>Operational voltage too low, no operation possible * Check installation and cable lengths, Follow installation instructions * Power supply module(s) overloaded, add power supply module(s) * Check terminal and module connections * Defective components, replace components</i>
EI33Dx EI3552	<i>Operational voltage too low * Check installation and cable lengths, Follow installation instructions * Power supply module overloaded * Check terminal and module connections * Defective component, replace components</i>
EI43Dx EI4552	<i>Operational voltage too low, no operation possible * Check installation and cable lengths, Follow installation instructions * Power supply module overloaded * Check terminal and module connections * Defective component, replace components</i>
EI5552	<i>The measuring unit is not compatible! * Contact Service</i>
EIA552	<i>Communication fault between MIQ/Alyza and ACM * Check cable connections * Check the power supply of the Alyza IQ * Contact service</i>

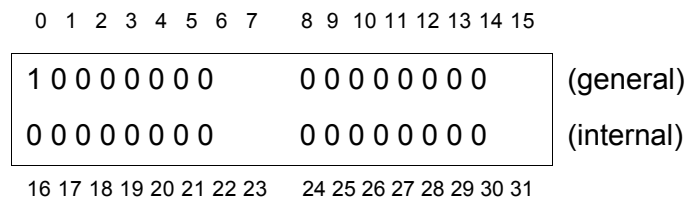
### 8.1.2 Informative messages

Message code	Message text
II13Dx II1552	<i>Language not available, Default language German * Contact service</i>
IC5552	<i>Alyza IQ was successfully calibrated * For calibration data, see calibration history</i>
IC7552	<i>Automatic calibration error: Calibration standard could not be determined or is not suitable for current measurement range. Calibration is rejected. Measurement will be continued with active valid calibration! * Check the current measurement range * Check the calibration standard used</i>
IS1552	<i>The front cover of the measuring unit is open. Danger due to condensation water. * Close the front cover of the measuring unit immediately</i>

### 8.2 Status info

The status info is a coded piece of information on the current status of a sensor. Each sensor sends this status info to the controller. The status info of sensors consists of 32 bits, each of which can have the value 0 or 1.

#### Status info, general structure



The bits 0 - 15 are reserved for general information.  
The bits 16 - 21 are reserved for internal service information.  
You obtain the status info:

- via a manual query in the *Settings/Service/List of all components* menu (see system operating manual)
- by an automated query
  - from a superordinate process control (e. g. when connected to the Profibus)
  - from the IQ Data Server (see IQ SENSORNET Software Pack operating manual)

The evaluation of the status info, e.g. in the case of an automated query, has to be made individually for each bit.

**Status info  
Alyza IQ**

<b>Status bit</b>	<b>Explanation</b>
Bit 0	<i>Component hardware defective</i>
Bit 1-31	-

## 9 Appendix

### 9.1 Glossary

<b>Absorbance</b>	Logarithmic measure for the absorption of the sample; negative decadic logarithm of the transmission.
<b>Adjusting</b>	To manipulate a measuring system so that the relevant value (e. g. the displayed value) differs as little as possible from the correct value or a value that is regarded as correct, or that the difference remains within the tolerance.
<b>Blank value</b>	The blank value is the measured value of a measuring system if the measured parameter has the value zero or is nonexistent. The blank value has to be determined and subtracted from the measured values of the actual samples.
<b>Calibration</b>	Comparing the value from a measuring system (e. g. the displayed value) to the correct value or a value that is regarded as correct. Often, this expression is also used when the measuring system is adjusted at the same time. See «Adjusting».
<b>Citation forms</b>	Different display formats that can be derived from each other of the measured value for a concentration. The method for determining phosphate provides, for example, a measured value for phosphorous P. This measured value can also be quoted in other citation forms such as PO <sub>4</sub> , PO <sub>4</sub> -P or P <sub>2</sub> O <sub>5</sub> .
<b>Concentration</b>	Mass or amount of a dissolved substance per volume, e. g. in g/L or mol/L.
<b>Deionized water</b>	Water that was freed of minerals with the aid of an ion exchanger. Deionized water may still contain uncharged contamination such as organic compounds. It is also called DI water.
<b>Eutrophication</b>	The excessive pollution of water bodies with nutrients is called eutrophication or overfertilization. To fight against the eutrophication of a water body, the phosphate load has to be reduced first of all. When the phosphate supply is limited, the nitrate contents cannot be consumed by plants even if they are available in huge quantities.
<b>Firmware</b>	The software permanently assigned to an instrument.
<b>Ground fault circuit interrupter</b>	Earth leakage circuit breaker. An electrical assembly group that switches off a circuit as soon as the strength of current in the phases does not exactly agree with the strength of current in the neutral conductor. The current difference can be caused by a grounded person inadvertently touching a live part of the circuit.
<b>LED</b>	Light emitting diode.

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<b>Measured parameter</b>	The measured parameter is the physical dimension determined by measuring, e. g. pH, conductivity or D.O. concentration.
<b>Measured value</b>	The special value to be determined of a measured parameter. It is given as a combination of the numerical value and unit (e. g. 3 m; 0.5 s; 5.2 A; 373.15 K).
<b>Measuring system</b>	A measuring system comprises all the devices used for measuring, e. g. meter and sensor. In addition, there is the cable and possibly an amplifier, terminal box and armature.
<b>MSDS</b>	Safety datasheets (Material Safety Data Sheets). Usually, the chemicals manufacturers provide safety datasheet with the chemicals delivered. The safety datasheets provide security relevant information on the substances delivered. MSDS can also be found on the Internet.
<b>Operator</b>	Legal designation for the owner of the system. The operator is responsible for the installed system, especially for the safety and training of the staff.
<b>pH value</b>	A measure of the acidic or basic effect of an aqueous solution. It corresponds to the negative decadic logarithm of the molal hydrogen ions activity divided by the unit of the molality. The practical pH value is the value of a pH measurement.
<b>PPE</b>	Personal protective equipment. The PPE includes clothing and other equipment that is used to protect you against risks at your place of work. You must always wear your PPE while doing dangerous jobs to avoid injuries or damage to your health. Typical examples are gloves, protective goggles, face protection shield, breathing protection, ear protection, safety helmet, safety shoes, fall protection. The PPE must fulfill the national standards and laws.
<b>Reset</b>	Restoring the original condition of all settings of a measuring system.
<b>Resistance</b>	Short name for the electrolytic resistivity. It corresponds to the reciprocal value of the electrical conductivity.
<b>Resolution</b>	Smallest difference between two measured values that can be displayed by a meter.
<b>Slope</b>	The slope of a linear calibration function.
<b>Standard solution</b>	A solution whose measured value is known per definition. It is used to calibrate a measuring system.
<b>Test sample</b>	Designation of the test sample ready to be measured. Normally, a test sample is made by processing the original sample. The test sample and original sample are identical if the test sample was not processed.
<b>Transmission</b>	The part of the light that goes through the sample.

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## 10 Contact Information

### 10.1 Ordering & Technical Support

Telephone: (800) 897-4151  
(937) 767-7241  
Monday through Friday, 8:00 AM to 5:00 PM ET

Fax: (937) 767-1058

Email: [info@ysi.com](mailto:info@ysi.com)

Mail: YSI Incorporated  
1725 Brannum Lane  
Yellow Springs, OH 45387  
USA

Internet: [www.ysi.com](http://www.ysi.com)

When placing an order please have the following information available:

- YSI account number (if available)
- Model number or brief description
- Quantity
- Name and Phone Number
- Billing and shipping address
- Purchase Order or Credit Card

### 10.2 Service Information

YSI has authorized service centers throughout the United States and Internationally. For the nearest service center information, please visit [www.ysi.com](http://www.ysi.com) and click 'Support' or contact YSI Technical Support directly at 800-897-4151.

When returning a product for service, include the Product Return form with cleaning certification. The form must be completely filled out for an YSI Service Center to accept the instrument for service. The Product Return form may be downloaded at [www.ysi.com](http://www.ysi.com) and clicking on the 'Support' tab.







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- 2) a leading global water technology company.

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